The Spirit of Technology:
A Pneumatological Analysis of the Discourse on Technique

by

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AUTHOR'S DECLARATION

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

ABSTRACT

THE SPIRIT OF TECHNOLOGY: A PNEUMATOLOGICAL
ANALYSIS OF THE DISCOURSE ON TECHNIQUE

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       This thesis explores the use of spirit-language in technological discourse in order to show that the category of spirit is viable within technological discourse and that spirit-language can be a new way for theology to engage with technology.

       This thesis demonstrates the need for theological engagement with technology, in the first place, by surveying the existence of moral evaluations in current popular and academic discourse about technique and by citing examples of comparable engagement drawn from ethical discourse and from ancient mythologies. Since morality, ethics, and mythology traditionally belong to religion and theology, theological engagement with technology is warranted. Yet, the current state of theological engagement with technology is typically cautious. In this context, the recent introduction of spirit-language into technological discourse opens up a new and important way for theology to engage critically and constructively with technology.

       This thesis then surveys the use of spirit-language in technological discourse in order to create a context for theological engagement with technology. "Spirit" is conceptualized in various and inconsistent ways in technological discourse. The "spirits" assumed by technological discourse have religious, ethical, and social consequences. Analysis and evaluation of these implicit pneumatologies represent ways for theology to critically and constructively engage with technology.

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The task of thinking and writing always depends on a network of people for encouragement and support, and the writing of this thesis has been no different. As I come to its conclusion, I am especially reminded of the significant people and events that have been instrumental in bringing it to completion.

It was while researching a paper on the prophetic role of theology during my undergraduate program that I first encountered the writing of Jacques Ellul, through a little book entitled *Anarchy and Christianity*. It was only later that I discovered that Ellul was better known for his work on technology than for his political theology. Yet that little book was pivotal in my thinking about both theology and technology.

The other important dimension of this thesis came to me during a graduate seminar on the Holy Spirit, led by Dr. Jeremy Bergen, my professor and, later, my adviser. It was during that seminar that I encountered both the ubiquity and the ambiguity of the concept of spirit and connected it to technology. Throughout the writing process, Jeremy has always offered kind encouragement and criticism when it was needed, and I owe him a debt of gratitude for the work he did to make sense of my unformed ideas and false starts.

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Finally, I must acknowledge and thank my wonderful partner. Sherri has listened to every draft of this thesis, and several that were never written. As a scholar, Sherri inspires me toward excellence, and her passion for the church is a constant anchoring point. She has experimented alongside me at integrating theory with life, she challenges me to remain realistic, and she fills my life with grace and beauty. Together, we share the joy of parenting Arthur, who is teaching us the meaning of spirit and life.

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Yes, I love technology
But not as much as you, you see
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Always and forever

-- Kip (*Napoleon Dynamite*)

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To the neon god they made
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I love you so much anyway
And on your breast I gently laid
Your arms surround me in the lake
I am joined with you forever

-- Sufjan Stevens (*All Delighted People*)

Technology is basically neutral. It's kind of like
a hammer. The hammer doesn't care whether you use
it to build a house, or whether a torturer uses it
to crush somebody's skull.

-- Noam Chomsky (*The Purpose of Education*)

INTRODUCTION

What is technology? How does technology shape our lives, and what does theology have to say about it? The phenomenon of technique itself is a simple unity which is nevertheless multifaceted and complex. Unfortunately, the scholarly *discourse about technique* is contested and sometimes unclear, and here theology shares some of the blame. Conceptualizing the complexity and the unity of technique (not to mention the external context) simultaneously is quite difficult. It is easier, in the short term, to address technique in its individual instances, rather than to conceptualize technique as a phenomenon. Yet it is precisely this ability to hold the complexity and the unity of technique in balance that is required of theology if theology is to have a relevant, critical, and ultimately hopeful word for people. Only then can theology address the ongoing concerns that people have about technique as they experience it: technique that operates in mundane and ubiquitous devices, but also in systemic and embedded structures.

So then, why theology? The choice to analyze technique from a theological perspective rather than from some other perspective, say, political or economic, is not arbitrary. Historically, religious worldviews have effectively marked out the domain of the technical and the non-technical, while in modern times the expansion of technique

into domains previously considered sacred has been linked to developments in Christian theology. In particular, a robust concept of spirit has been linked with successful limitation of technique in the past, while conversely the exponential growth of technique in Western cultures has been linked to a worldview which severely limits the role of spirit in the world. These are good reasons to explore a connection between spirit and technique, and yet there is at least one basic question which stands as a problem: what does religion have to do with the arts and crafts?

Theological thinking about technique has often been limited by a lack of appropriate categories for analyzing technique. The most common categories in use by theology today are incarnation and creation or co-creation. Yet, after more than a century of demythologizing at the hands of materialist epistemology, the concept of spirit is making a comeback in the broader discourse about technique itself. So the category of spirit offers a new avenue for theology to enter into the discourse about technique. But what is that spirit? Does it bear any relation to the traditional Christian understanding of the Spirit of God? How should Christian pneumatology think about this spirit?

In this thesis, I argue that *Christian pneumatology can shape modern thinking about technique by engaging with the spirit language in technological discourse*. By focusing on spirit, I believe that theology can get at the heart or essence of technique, even while it brings the resources of systematic pneumatology to the table. This work lays a foundation for future conversation between theology and technology.

Chapter 1 introduces the methodological issues that are relevant for my discussion of the spirit of technology. I begin with a short discussion of theology as grammar.

Language and grammar are key to this project, focused as it is on the use of *spirit-language* in the *discourse* about technique. I then offer a discussion of the terms "technique" and "technology," which will be helpful to the reader for understanding the use of the terms throughout this project. The dispute around terminology is unusually significant in the discourse about technique, and it is standard to find this discussion in cursory form at the beginning of any writing on technique. To summarize, I will be using "technique" to refer to rational means – art, craft, skill – and I will be using "technology" to refer to the discourse about technique – in the same way that "biology" refers to the discourse about living things. Finally, because various terms and capitalizations for spirit have been freighted with theological significance, I explain how I will be using "spirit."

Chapter 2 explores the moral significance of the discourse about technique and the need for deeper theological engagement. I begin by discussing some of the ways that technique is being understood in popular culture. This, for me, is the most important reason for theology to begin to grapple with technique, because it shows an area of life that matters a great deal to many people, but where they are not receiving sufficient guidance by theology. I move from popular culture to academic literature to show that the issues are not settled there either. I then refer to ethics as an example of the most significant kinds of theological engagement with technique that are currently taking place. Finally, I introduce some older cosmological perspectives as an example of theological, and in particular pneumatological, grappling with technique.

Having laid out a case for theological engagement with the discourse about technique, in the second part of chapter 2 I survey the types of theological engagement

with technique. The two broad traditions are summarized as describing and imagining. My critique is that the describing tradition, though it is critical, tends to lack constructive and compelling myths or a prescriptive element, while the imagining tradition is prescriptive and mythological, but tends to be insufficiently critical of technique.

Chapter 3 begins to open up new avenues into a theological discussion of technique. I survey the use of spirit-language in four discourses: religion-and-science, ecology, social criticism, and technology proper. These discourses are technological because they discuss technique, but, except for the last, they are not technology proper because they are primarily concerned with other issues. Yet these discussions have important implications for the discourse about technique. For the purposes of this project, the way in which spirit-language is used in these discourses reveals an implied pneumatology which can be discussed by theology.

Chapter 4 sets up a comparison between biblical pneumatology and the implied pneumatologies of technological discourse. Points of conversation include the materialism of spirit, the personality of spirit, empiricism as a religious perspective, pluralism as a religious perspective, the immanence and transcendence of spirit, and the role of unity and difference as they relate to sympathetic and critical perspectives on technique. Along the way, biblical pneumatology is read back into technological pneumatologies in order to produce a theological criticism.

CHAPTER 1:
METHODOLOGY

Before I set out, three methodological issues need to be addressed. The first is the question of what kind of project this is going to be. Throughout this work, I approach theology as grammar, and so I focus on the use of words and language about technique rather than on the phenomenon of technical devices themselves. Because I am approaching theology as grammar, the second two issues have to do with word usage. In the first case, I argue for a disciplined used of "technique," "technology," and "device." In the second case, I make a pragmatic choice to remain neutral with reference to the words "spirit," "Spirit," "The Spirit," "Spirit of God," "The Holy Spirit," etc.

THEOLOGY AS GRAMMAR

Throughout this project, the focus is on the use of language, but why? Ever since René Descartes and the Enlightenment, thinking about the relationship between mind and matter (and, by implication, between spirit and technical devices) has followed what Gilbert Ryle characterized as "the dogma of the Ghost in the Machine."[1] As Ryle saw it, the relationship between mind and matter was being unnecessarily confused by philosophers because of a failure to recognize the categorical differences between mind

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1   Gilbert Ryle, *The Concept of Mind* (New York, NY: Routledge, 2009), 5–8.

and matter – a category mistake caused by asking the wrong questions. Even earlier, Ludwig Wittgenstein challenged philosophers to pay attention to the use of ordinary language as a way of solving philosophical problems.[2] Though Wittgenstein has been critiqued for disregarding traditional methods of inquiry and perhaps for oversimplification, language theory is beginning to shape many fields of academic discourse. Together, the insights of Ryle and Wittgenstein indicate that the language about technique and the categories that are used matter.[3]

The relationship of theology (the discourse about God or religion) to technology (the discourse about the arts and crafts) is a problem. As a way into this problem, I intend to follow Wittgenstein's impulse, as developed by postliberal theologians George Lindbeck, Paul Holmer, and Hans Frei, of theology as grammar.[4] Wittgenstein's proposal is based on the observation that the word "God" is used in a particular and unique way. William H. Brenner helpfully summarizes the point:

> I learned that "God sees me" and "God rewards me" did not have the same consequences as "Aunt Martha sees and rewards me." I learned that religious people speak of God's seeing and rewarding when nobody is around to observe them and no reward is expected. I learned that one does not speak of God's help as the result of identifying somebody, some helper.[5]

For Wittgenstein, theology is not an empirical science of God, but rather a discussion about the grammatical rules (doctrines) that govern the word "God" in everyday speech

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2 Ludwig Wittgenstein, *Philosophical Investigations* (Oxford: Blackwell, 1958).

3 For a recent example, see the study by Craig Palmer *et al*., who argue that the important thing about magic, and indeed all religious behaviour, is *communication* rather than belief in supernatural phenomena, and that this communication produces social change, specifically cooperation. Craig T. Palmer *et al*., 'The Importance of Magic to Social Relationships', *Zygon* 45, no. 2 (2010): 317–37.

4 Craig A. Phillips, 'Postmodernism', ed. Erwin Fahlbusch *et al*., trans. Geoffrey W. Bromiley, *The Encyclopedia of Christianity* (Grand Rapids, MI: Eerdmans, 2005), 301.

5 William H. Brenner, 'Theology as Grammar', *The Southern Journal of Philosophy* 34 (1996): 442.

and practice. As with learning grammar, theology is not done for its own sake, but in order to structure behaviour. Moreover, just as the rules of grammar may differ between communities, the way in which the word "God" is used belongs to the particular community using the word – in this case, members of the Christian religion.[6]

If theology is grammar in the sense that it is the discourse that "structures thoughts and expressions about God and other metaphysical concepts by means of language,"[7] then an analysis of the use of spirit-language in technology is an attempt to identify and clarify the *implicit theology* operative within those discourses. As I show, spirit-language is already being used by technology in particular ways and with a particular grammar. A comparison of the uses of spirit-language reveals the features of that grammar that so often remain assumed and unnoticed. I believe that it is important to understand the implicit pneumatologies in these discourses – not simply so that we can better understand technique, but because these pneumatologies, once established by technology, extend beyond technology into the rest of our theology and shape our very lives.

As with any language, theological language is shaped by its use as much or more than by its formal rules. Linguistic stability is a fiction. Languages are always in flux, and the grammar is constantly changing. Though grammatical rules and dictionaries are often presented as prescriptive, they are in fact merely descriptive of the present use and origins of language. This is not to say that the prescriptive aspect of grammar is irrelevant: the prescriptive and descriptive aims of grammar are dialectical, and both

6   Ibid., 452.
7   Phillips, 'Postmodernism', 301.

function to clarify assumptions and to enable communication, if only by enabling an asymptotic approximation of meaning among interlocutors.

Given that the use of language is at least as important as its formal rules, it should be clear that the use of implicit pneumatologies (descriptive) in technology will have an effect on pneumatology proper (prescriptive). The cumulative effect of the use of spirit-language in technology changes how spirit is conceptualized in culture as a whole. Furthermore, the evolution of the concept of spirit will result in further changes to the structure of the "thoughts and expressions about God and other metaphysical concepts"[8] – concepts such as human destiny, a sense of purpose, or the possibility of freedom. So the use of spirit-language in technology is not simply a curiosity for philosophers and theologians, it can be a handle for the kinds of changes to metaphysical understandings that are taking place globally. Technology matters to theology because technology alters the grammar of "spirit," and in so doing it makes theological propositions about issues of ultimate importance. So then, my theological analysis of technology will not attempt to explain technique in a quasi-scientific manner (religious rather than empirical) but rather will identify the conditions for placing technology within the discourse about God. It is my hope that, once placed within a theological narrative, the spirit-language in technology will be controlled by the grammar of that narrative, i.e., by pneumatology.

Defining "Technology" and "Technique"

Defining "technology" is a difficult problem. In the modern world, "technology" has become something of a catch-all term; almost anything can be described as

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8   Ibid.

technology. This demonstrates the power that the discourse about technique has over our collective imagination, but it also functions to make serious analysis of technique more difficult. The power to define "technique" or "technology" includes the ability to determine what "counts" and "doesn't count," and so to include or exclude those aspects that support one's agenda. Without a serious analysis of the definitions of "technique" and "technology," much of the discourse is set before the conversation has even begun.

"Technology" and "Technique"

In technical discourse, the two main terms used are "technology" and "technique," though terms such as "thing," "device," "instrument," "paradigm" or "socio-technical system" are sometimes used for the sake of greater precision. "Technology" and "technique" are used quite differently in common language and in academic discourse. Looking at both languages can be useful, however, in giving shape to what is meant by the terms.

In popular use

At a popular level, the words, "technology" and "technique," have a broad range of uses. "Technology" will most often refer to *a type of device or tool*, although complex gadgets such as computers or automobiles usually come to mind first. The phrase, "I love technology," actually means "I love gadgets." Typically, these are computerized, modern gadgets. Nevertheless, most people will agree that mundane objects like paper or dishes are also a form of "technology." As the definition of "technology" is pressed, however, the word begins to describe not only these objects, but also the *processes by which they*

are created. We intuit that possessing a particular technology may not mean possessing

an object, but rather the means (both mental and physical) to produce the technological

object. For example, a nation will be said to possess nuclear technology if its technicians

have the scientific knowledge and infrastructure (i.e., the means) to build nuclear devices,

whether or not that nation actually possesses such nuclear devices presently. Finally, in

common usage, technology can be *a cultural attribute*. Cultural phenomena like the radio

or the entertainment industry known as "Hollywood" can be described as cultural

technology.[9] This use of "technology" generally works on the level of civilizations, so

that a historian might say that printing press technology changed European civilization.

By this use of "technology," the historian does not mean merely the labour saving device

of the printing press, but the larger cultural development of mass communication entailed

by the printing press' ability to reproduce information quickly and reliably. So when

someone speaks of "nuclear technology" they may be referring to the hardware of a

nuclear device, to the technical knowledge and infrastructure required to build such a

device, or to the socio-cultural implications of nuclear devices as a symbol. In this way,

the word "technology" blurs the boundaries between knowledge, material, and symbol.

Yet this blurring is instructive, for in a technological milieu there is a strong impetus for

all knowledge to become applied knowledge, and for knowledge that cannot be applied to

lose value. Thus, in a technological milieu, there is no need to distinguish between

capability and actuality, or between potential and realized. Anything that is "real" can –

and will – be done.

    In contrast to these broad uses of "technology" in popular culture, the word

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9   Willem B. Drees, 'Religion In an Age of Technology', *Zygon* 37, no. 3 (2002): 599–600.

"technique" is usually used more narrowly and refers to something more intangible like "skill" or "method." When "technique" is understood as "skill" or "method," it overlaps significantly with the second use of "technology" that I explored above – "technology" as a *process*. However, the word technique is not simply a specific word for the general category of technology-as-process. In common parlance, there is technique that is not assimilable to technology-as-process. This is because, as a general rule, "technology" has to do with the manufacturing process and/or the manipulation of natural objects. So, for example, a marathon runner's *technology* would include things like shoes, clothing, and hydration equipment, but the runner's *technique* would refer to the way in which she moves her legs and arms, controls her breathing, holds her head, etc. This use for "technique" would never be confused with "technology," even though both "technique" and "technology-as-process" refer primarily to "means." What this demonstrates is that, in popular discourse, "technique" is more than just a term for "technology-as-process." There is overlap, but not complete subsumption.

In academic use

Within academic discourse, the terminology is also unsettled. The study of technique takes places within a range of disciplines, involving scientists, engineers, economists, sociologists, historians, and philosophers (to name a few). Some fields use the word "technology" in a very precise and restricted way, while others use the word in more inclusive or abstracted ways. In general, disciplines whose scope is more focused (like science and engineering) tend to use the word, "technology." However, disciplines whose purview is more broad (like sociology and philosophy) have developed a range of

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terms to describe the different aspects of "technology" that come into view. Instead of "technology," terms like "hardware," "artifact," "knowledge," "technique," "method," or "socio-technical system" are often used and help to make important distinctions.[10]

Yet the question remains: what is the thing being studied? Is the object under scrutiny "technology" or "technique"? Within the disciplines of the physical sciences and engineering, the standard answer is "technology." Engineers study technology in order to build technology and use technology. For these disciplines, the analysis of technology is primarily "internal," that is, they are interested in the efficiency, proper functioning, or immediate use of the device internal to itself.[11] Within the disciplines of the social sciences and the arts, the answer is more likely to be "technique." Sociologists want to understand what effect technique is having on families, communities, or society. Yet even this bifurcation is somewhat simplistic. There is a further divide between social scientists in Europe and those in North America. Canadian social philosopher George Grant observed that, "In distinction from the usage in English of 'technology' and 'technologies,' the Europeans have generally used 'technique' and 'techniques,' the former for the whole array of means for making events happen, the latter for the particular means."[12] So, even in the social sciences, the use of "technique" or "technology" is determined for the most part by the accident of a European or a North American cultural context. Why is this?

The difference between the North American and European choice of terms can be

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10 Stephen J. Kline, 'What Is Technology?', *Bulletin of Science, Technology & Society* 5, no. 3 (1985): 215–217.

11 The term "internalist" comes from Staudenmaier's discussion of internalist history, which, "is 'internal' history because the focus of attention is centred almost completely on the artifact itself rather than on how the artifact relates to its external social context." John Staudenmaier, *Technology's Storytellers: Reweaving the Human Fabric* (Cambridge, MA: MIT Press, 1985), 9.

12 George Grant, *Technology and Justice* (Toronto, ON: Anansi, 1986), 11.

partially explained by differences in language as well as the historical development of words. For example, in modern French, *technique* roughly translates as English "technology," and can be used in many of the same ways as the English word.[13] On the other hand, French *technologie* refers to a systematic discourse or study about *technique*.[14] Finally, the phrase *arts et métiers*, literally translated "arts and crafts" or "arts and trades," is also associated with technology, but refers only to applied arts and skills.[15] It functions more like the English word, "engineering."[16] For various reasons, the English word "technology" developed along different lines than *technologie*, resulting in different terminological preferences. Eric Schatzberg locates the source of this metamorphosis in German debates concerning *die Technik*, and the way in which "technic" was brought into English in the twentieth century.[17] These observations offer an explanation for the differences based upon historical accident, but the differences are now deeper than divergent etymology.[18]

Another important difference between European and North American scholarship is the scope of study that is attempted. While North American scholars tend to limit their studies to the effects of a particular "technology" upon a discreet area of life (e.g., Paul Lazarsfeld's study of the effects of television on children[19]), European scholars are more

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13 Michela Clari and Martyn Back, eds., 'Technique', *Collins Robert French Dictionary* (Glasgow: HarperCollins Publishers & Dictionnaires Le Robert, 2004), 521; Kline, 'What Is Technology?', 216.

14 Stephen V. Monsma, *Responsible Technology: A Christian Perspective* (Grand Rapids, MI: Eerdmans, 1986), 11; Grant, *Technology and Justice*, 11.

15 Monsma, *Responsible Technology*, 11.

16 On the connection between technique and engineering, see Donald S. L. Cardwell, 'Problems of the Data Base', in *The History and Philosophy of Technology*, ed. George Bugliarello and Dean B. Doner (Urbana, IL: University of Illinois Press, 1979), 4.

17 Eric Schatzberg, '"Technik" Comes to America: Changing Meanings of "Technology" before 1930', *Technology and Culture* 47, no. 3 (July 2006): 488–496.

18 Monsma, *Responsible Technology*, 11; Kline, 'What Is Technology?', 216.

19 Paul F. Lazarsfeld, 'Why Is So Little Known About the Effects of Television on Children and What Can Be Done?', *Public Opinion Quarterly* 19, no. 3 (1955): 243–51.

inclined to a systemic analysis of "technique" on society as a whole (best exemplified by

Jacques Ellul, but also seen in the neo-Marxist critiques of Jürgen Habermas and Herbert

Marcuse).[20] Within academic literature, then, the choice of "technique" or "technology"

can signify an approach to the study itself – either broad and systemic, or narrow and

isolated.

Definitional Strategies

Modern English deals with the ambiguity of the word, "technology," in a variety

of ways. In her survey of current approaches, Susan White includes a note distinguishing

between those that focus on "technological hardware" and those that focus on a

"technological worldview."[21] John Staudenmaier's study discerns a difference between

inclusive, systemic studies of technology in Europe and narrowly focused studies of

particular technology in North America.[22] Carl Mitcham, summarizing the various

approaches to a history of technology, finds three types: 1) a "technological history,"

which is the history of hardware; 2) a "social history of technology," which is the history

of the effects of that hardware on society, and 3) a "history of ideas about technology,"

which is the history of human perceptions about the various hardware.[23] Each of these

authors' broad classifications can be seen as an attempt to create a handle for

understanding technology as a process or device *vis-à-vis* technology as a systematic

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20 Staudenmaier, *Technology's Storytellers*, 10.
21 Susan J. White, *Christian Worship and Technological Change* (Nashville, TN: Abingdon Press, 1994), 132 n10.
22 Staudenmaier, *Technology's Storytellers*, 10.
23 Carl Mitcham, 'Philosophy and the History of Technology', in *The History and Philosophy of Technology*, ed. George Bugliarello and Dean B. Doner (Urbana, IL: University of Illinois Press, 1979), 167.

discourse. These classifications could be greatly simplified by a discerning use of the

terms "technology" and "technique."

Etymology of "technology"

Etymologically, "technic" is an adjective for anything "pertaining to art or an art."

"Technique" is the "manner of artistic execution," while "technology" is a "scientific

study of the arts" or "technical terminology."[24] "Technology" is an adaptation from the

Greek word, *technologia*, a combination of *techne* (art, skill, craft, method, system) +

logia (words, discourse), which originally meant a "systematic treatment of an art, craft,

or technique."[25] In particular, *technologia* was first used in Aristotle's *Rhetoric* with

reference to a systematic discourse (*logia*) about (word)craft (*techne*) including grammar,

rhetoric, etc.[26]

The modern English word, "technique," derives from Greek *techne*, through

French *technique*, which has both adjectival and nominal uses. The French adjective

technique has the sense of "technical," and in its modern nominal use *la technique* can be

translated as "technique" (method) or as "technology."[27] The former sense is preserved in

the modern English definition of "technique" as:

> Manner of artistic execution or performance in relation to formal or
> practical details (as distinct from general effect, expression, sentiment,
> etc.); the mechanical or formal part of an art, esp. of any of the fine arts;
> the manner of execution or performance in any discipline, profession, or
> sport; also, skill or ability in the department of one's art; mechanical skill
> in artistic or technical work (freq. used without article or qualifying word).

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24 C. T. Onions, G. W. S. Friedrichsen, and R. W. Burchfield, eds., 'Technic', *The Oxford Dictionary of English Etymology* (Oxford: Clarendon Press, 1966), 906.
25 Ibid. See also Monsma, *Responsible Technology*, 11.
26 Mitcham, 'Philosophy and the History of Technology', 183; Monsma, *Responsible Technology*, 11.
27 Clari and Back, 'Technique', 521.

loosely, a skilful or efficient means of achieving a purpose; a characteristic way of proceeding; a knack, a trick.[28]

"Technique," defined in these ways, encompasses many of the concepts that I earlier grouped under the umbrella of technology-as-process.

Prior to the twentieth century, the English word "technology" basically agreed with its French and German counterparts to mean, "1) the arts of language – that is, grammar; 2) the discourse or description of the arts; and 3) the terminology of a particular art or the arts in general (as used here, art includes both the fine and mechanical arts)."[29] In the twentieth century, however, the meaning of the term evolved from a discourse on the arts in general to the mechanical arts in particular, after which it took on the additional meaning of the practice of the mechanical arts.

> Using a term that in the original Greek had referred to the systematic use or 'crafting' of words to refer to the systematic 'crafting' of the physical world reflects the fact that Galileo, Descartes, and other seventeenth-century thinkers had led their age to think in terms of dominating and manipulating nature.[30]

According to an etymological strategy then, "technology" should be used exclusively for the discourse or study of technique, and "technique" should be used to refer to an art, craft, skill, or method. Furthermore, both of these are distinguished from the products of an art or craft (i.e., artifact, hardware, device).

"Technology" as neologism

Etymology notwithstanding, most North American scholars accept the common

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28 J. A. Simpson and E. S. C. Weiner, eds., 'Technique', *The Oxford English Dictionary* (Oxford: Clarendon Press, 1989), 704.

29 Schatzberg, '"Technik" Comes to America', 489. See also Mitcham, 'Philosophy and the History of Technology', 184; Monsma, *Responsible Technology*, 11.

30 Monsma, *Responsible Technology*, 11.

usage of "technology" as a *fait accompli*, while some actively seek to defend it. There are

indeed some good reasons for accepting the neologism of "technology." The first and

most obvious one is simply for convenience. Established usage in North America prefers

"technology," and it is very difficult to change the definition of a word once established.

Furthermore, using a word in idiosyncratic ways can detract from the accessibility of an

argument. Therefore, it is usually best to use a word in its most typical sense, unless there

are strong reasons against this.

The second reason for accepting the popular definition of "technology" has to do

with the very novelty of the word. Perhaps the boldest justification for "technology" is

put forward by Grant. While acknowledging the divide between American and European

use of "technology" and "technique," he argues that "technology" is actually a highly

appropriate word. For Grant, "technology" fittingly conveys the novelty of hybridity in

the modern era between the sciences and the arts.

> When "technology" is used to describe the actual means of making events
> happen, and not simply the systematic study of these means, the word
> reveals to us the fact that these new events happen because we westerners
> willed to develop a new and unique co-penetration of the arts and sciences,
> a co-penetration which has never before existed. What is given in the
> neologism – consciously or not – is the idea that modern civilisation is
> distinguished from all previous civilisations because our activities of
> knowing and making have been brought together in a way which does not
> allow the once-clear distinguishing of them. In fact, the coining of the
> word "technology" catches the novelty of that co-penetration of knowing
> and making. It also implies that we have brought the sciences and the arts
> into a new unity in our will to be the masters of the earth and beyond.[31]

Furthermore, Grant suggests that the novelty expressed by the word "technology" is the

distinguishing feature of modern civilization. The difference between modern

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31 Grant, *Technology and Justice*, 12.

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"technology" and Greek *techne* is not simply a matter of scale or of relative efficiency; it is an ontological difference, with a reconfigured relationship between knowledge and power.[32] From this perspective, the word "technology" is not merely a grammatical accident, but is an apt expression of the fundamental change that has taken place.

One problem with Grant's approach to the problem of terminology is that "technology" was used in pre-modern times (e.g., Greek *technologia*, French *technologie*). To be clear, Grant's usage would strictly require that we never refer to "technology" in pre-industrial societies, since "technology" by his definition is modern. But, given that the word did exist in pre-industrial societies, there would need to be a way for historians, at least, to use the word in its pre-modern contexts. This would require careful nuance in order to differentiate ancient "technology" as a "discourse about an art" from the modern sense of "technology" as the "co-penetration of sciences and arts."

In addition, Grant's proposal is based on the assumption that the co-penetration of knowing and making, expressed in the neologism "technology," is fundamentally novel. However, this assumption is itself one of the issues under debate within the philosophy of technology. It may be the case that technique has always involved such a co-penetration of knowing and making (contra Grant), in which case the novelty of modern times is not this relationship, but its transgression of traditional boundaries.[33] This argument has been advanced by Ellul and explored in detail by Gregory Davis.[34]

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32 Ibid., 12–14, 32.

33 Carl Mitcham suggests that this is a result of the view of matter as something inert rather than as something which has its own purpose and is in some sense "alive." See Mitcham, 'Philosophy and the History of Technology', 186.

34 Gregory Davis, *Means Without End: A Critical Survey of the Ideological Genealogy of Technology Without Limits, from Apollonian Techne to Postmodern Technoculture* (Lanham, MD: University Press of America, 2006); Jacques Ellul, *The Technological Society*, trans. John Wilkinson (New York, NY: Alfred A. Knopf, 1976), 27–29.

Levels of "technology"

Another way in which the ambiguity of "technology" is explained is through a

heuristic of levels. Willem Drees has identified four levels on which we can experience

and discuss technology. The first level, that of material manifestations, consists of

devices (e.g., a mobile phone) and the infrastructure (e.g., radio transmission towers) in

which such devices are embedded. These material manifestations interface with

technology on the social level. That is, they involve a social system (e.g., the phone

system) which requires certain skills (e.g., the operation of mobile phones, mobile phone

repair, radio tower maintenance). The third level is psychological. At this level,

technology consists of certain technological attitudes (e.g., the expectation of immediate

contact with others). All of this is experienced in the context of the fourth layer: culture.[35]

> Technology is not a separate segment of our lives, but it pervades and
> shapes our lives. It is the world in which we live. Antibiotics, sewage
> systems, contraceptive pills, refrigerators, and central heating systems are
> more than new means. Antibiotics and sewage systems changed our sense
> of vulnerability (limiting enormously the number of parents who had to
> bury their own infants). The pill changed relations between men and
> women and between parents and their children. Thanks to the refrigerator
> and the microwave we can eat whenever it suits us, individually, and each
> according to his or her taste, and thus the common meal as a major
> characteristic of the day has lost significance. Central heating has made the
> common room with the fireplace less important; we can each spend our
> time in our own rooms in the way we like. Technology makes life easier
> and more attractive; music is available without effort on my part, except
> for switching on the stereo.[36]

The use of levels helps Drees explain the range of concepts to which "technology" can

refer. Following this strategy, definitions of "technology" are usually stated in the

broadest terms possible, with the aim of adequately accounting for the phenomena

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35 Drees, 'Religion In an Age of Technology', 599–600.
36 Ibid., 600.

included under the term "technology" and at the same time differentiating technology from other aspects of human experience.

Differentiating "Technology" and "Technique"

Given the discussion above, in this paper I reserve the word "technology" for the systematic discourse about technique, where "technique" refers to skills and rational methods (i.e., the applied arts and crafts). I accept that a major disadvantage to this approach is the easy confusion between this highly specific definition and its more typical use by scholars and in popular discourse. Nevertheless, the advantages seem greater: higher differentiation between terms should contribute to the perspicuity of my argument.

The choice to limit the use of "technology" to "the study of technique" clarifies because it maintains the difference between the *study* of a rational method, art, or craft (in which there is some degree of separation) and the *practice* of that rational method, art, or craft (which is immediate). Returning to Aristotle's use of *technologia*, we can easily discern the difference between studying rhetoric and using rhetoric (even though Aristotle may have used rhetoric as a tool for teaching rhetoric). Similarly, by reserving the word "technology" for the discourse about technique, I am better able to distinguish between the use of technique and the discourse about technique.

Secondly, though I began by differentiating "technology" (as process) from technique, perhaps the more common mistake today is to use "technology" with reference to the instruments of technique, or to the outcomes of technique. Here also, the limited use of "technology" maintains the difference between the systematic study of a rational

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method and the tools or outcomes of that rational method. Consider three examples:

1. Levers. In the case of moving a boulder, it is easy to differentiate between the rational method (technique), the tool, and the outcome of that method. Using a lever is the rational method (**technique**) for lifting a heavy object. The lever is the **tool**, and the displacement of the object is the **outcome**. (The technique here can also be differentiated from non-technique: brute force exerted by pushing on the boulder.) The study or discourse of the workings of levers is lever **technology**.

2. Rhetoric. In the case of speech, rhetoric is the **technique** – a rational means of persuasion. Words are the **tools** of rhetoric, while persuasion or action is the **outcome** of the technique. (Again, the technique here can be differentiated from non-technique. It is possible to compel a listener to action without a rational procedure, e.g., by yelling, but this would not be considered rhetoric.) The study of rhetoric is **technology**. This is indeed the original sense of Aristotle's *technologia*.

3. Computers. In the case of computers, computing is the **technique** (i.e., art or craft). It is considered to be the most rational method for achieving various ends.[37] The computer is the **tool**, and, while there are many different eventual outcomes (e.g., the solution to the equation or the written book), the output to peripheral devices (monitor, printer, etc.) is the immediate **outcome**.[38] The study of computing is computer

technology.

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37 Although it could be argued that the possible goals of computing are much more diverse than those of levers and rhetoric, it is still a single technique in that working with digital information is chosen as the "best" (most efficient, or most rational) method for solving advanced mathematical problems, writing a book, etc.

38 The confusion around the language of "computer technology" is particularly problematic because of our heightened awareness that the computer itself is the product of other (manufacturing) techniques, many of which are themselves computerized. This is why identifying the outcome and the tool is so important.

These three examples suggest another important advantage to the use of carefully differentiated terms. The use of "technology" purely for "the discourse about technique" provides the conceptual tools to think about such a discourse, and even possibly to critique it. Differentiation allows us to critique, for example, the discourse about levers, without necessarily critiquing their use. Or it may be the case that someone is less concerned with the discourse and study of rhetoric in general, but would like to evaluate Aristotle's particular *technologia*. Today, we are well acquainted with computerized devices, and we have difficulty seeing them as anything other than neutral tools. Perhaps this is because we generally have no *word* for "the discourse about computers," and so we are ill-suited to think about such a discourse, let alone to evaluate it.[39]

A Note on Spirit/spirit

The use of the term "spirit," with or without capitalization and/or the definite article, has become theologically and politically significant. George Tinker draws attention to the political significance of capitalization in general in his book, *Spirit and Resistance*, where he chooses to capitalize "White" but not "european" or "american."[40] Kirsteen Kim's book, *The Holy Spirit in the World*, specifically addresses the divisiveness of different concepts of spirit – as well as their potential to unify – beginning with an anecdote about the controversy surrounding the opening event for the World Council of

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39 The word "discourse" here is crucial, because we do in fact have a term for a very limited "study" of computers: computer engineering. What is included under engineering, however, is much narrower than the type of discourse involved in "technology." Engineering is focused solely on the effectiveness and efficiency of computers. Computer technology as a discourse would include engineering, but it would also include broader discussions about the general usefulness of computers, the ways in which they could be used in the future, the social benefits and drawbacks of computers, etc.

40 For an explanation, see George E. Tinker, *Spirit and Resistance: Political Theology and American Indian Liberation* (Minneapolis, MN: Fortress Press, 2004), xi–xii.

Churches (1991) at the Canberra Assembly, the theme of which was "Come, Holy Spirit, renew the whole creation."[41] The controversy was caused by the fact that understandings of the relationship of the Holy Spirit to spirit and spirituality vary significantly throughout global Christianity. The Orthodox churches

> expressed "alarm" at a lack of discernment in affirming the presence of the Spirit in human movements, without regard for sin and error; and they stressed the need to "guard against a tendency *to substitute a 'private' spirit, the spirit of the world, or other spirits for the Holy Spirit*" (italics original).[42]

Evangelical churches had similar concerns, specifically raising "the question of whether the Holy Spirit could be considered to be at work in the whole creation" and also questions about "syncretism."[43] Kim goes on to explore the many ways in which spirit is understood globally. In Western modernity, for example, "Cultural understanding of "spirit" is linked with pixies, fairies and demons in the fantasy world of wizards and witches"; however, in post-modernity and especially New Age spirituality, "'spirit' has become a catchword for marketing anything cool – including cigarettes, clothing, health cures – and 'spirituality' is a politically correct means of self-expression."[44] Traditional Korean, Indian, and North American Indigenous cultures have their own pneumatologies. Historically, the Holy Spirit has been neglected by theology, which turns discussions of the Holy Spirit into discussions of the Church. As a result, the various understandings of "spirit," globally and theologically, call up different concepts: personal "ghosts," forces in nature and in human institutions, superstition, or the embodiment of Life (just to name

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41 Kirsteen Kim, *The Holy Spirit in the World: A Global Conversation* (Maryknoll, NY: Orbis Books, 2007), viii–xiv.
42 Ibid., ix.
43 Ibid., x.
44 Ibid., 1–2.

a few).

Out of sensitivity to this issue, throughout this work I intentionally use the term "spirit" – lowercase, without the definite article – unless the context explicitly refers to the Spirit of God. My intention for this word usage is to remain as neutral as possible on the various pneumatologies. Furthermore, I use the term "Spirit of God," rather than "Holy Spirit," which is traditionally associated with the Church, in order to suspend evaluation on the issue of the presence of the Spirit of God in the world. This thesis draws on a wide range of thinkers, from within and outside the Christian tradition, and it is not always clear how these thinkers conceptualize spirit. Indeed, even if it were possible to coherently map each concept of spirit, the terminology would soon become too unwieldy to use. Instead, I have chosen to focus on technology and leave the question of spirit for another project.

CHAPTER 2:
WHAT HAS ATHENS TO DO WITH JERUSALEM? A REVIEW OF THE LITERATURE ON TECHNOLOGY AND THEOLOGY

At first glance, theology and technology do not seem to have very much in common. In a kind of "two kingdoms" theology, technology seems to deal with the physical world, while theology deals with the spiritual. Yet, as we will see, theology and even pneumatology have a long history of engaging technology, but this engagement is often underrepresented or forgotten. Likewise, there are many examples of spirit-language in technology, which I will discuss in the next chapter. But before we examine the implicit pneumatology of technology, it will be important to have a context for the relationship between technology and theology in general. Theology and technology overlap in more than just their use of spirit-language. They both speak about the *imago Dei*, human origins and destiny, incarnation, and responsibility for creation, to name just a few regions of shared concern. In this chapter, I hope to give some shape to the landscape of this discourse, which will provide a context for the pneumatology of technology.

This chapter is divided into two sections. In the first section, I show that technology is theologically significant. Both morality and ethics are theological

discourses, even when they operate in a popular or secular sphere. Therefore, I begin by examining popular ethical evaluations of technical systems and devices. This is followed by a survey of some ethical and moral evaluations in academia, especially sociology and philosophy. Moving into the religious sphere, I cite some moral and ethical evaluations of technical development by religion-based social critics. Finally, I explore the evaluation of technique in ancient Greek mythology and philosophy. The purpose, assuming morality and ethics to be (at minimum) theological, is to demonstrate that there is indeed a demand for theological engagement with technology, and that this demand is not merely the invention of theologians themselves.

In the second section of this chapter, I survey the main ways in which theology has engaged with technology thus far. The two main ways have been descriptive and imaginative. In its descriptive mode, theology accepts technical developments as one of the conditions of the environment in which theology must operate, and so technique is allowed to "frame" society. It matters little if theology goes on to critique particular aspects of a technological society if technique remains the frame. In its imaginative mode, theology grapples more deeply with the significance of technical culture itself, especially in terms of participation with God, eschatological hope, and the *imago Dei*. However, the imaginative mode tends to overlook present-day difficulties with technique and the possibility that they may be reproduced in the techniques of the future.

The Theological Significance of Technology

Why should we think theologically about the *discourse* on technique? Would it not be more important to understand and speak theologically about technique itself, to

perhaps make some constructive evaluations of specific technical devices?[45] The discourse about technique is theologically significant because of the ubiquity of technique. Virtually all aspects of life have become technical, so that technology – *the discourse about technique* – now functions as one of the primary filters through which we experience reality. Anything that exerts as much influence and evokes as much passion as technology does ought to at least raise the interest of theology. For example, what moral claims are made by technology, and at what point does technology become idolatrous?

In this section, I examine four perspectives on the moral significance of technology: popular culture, social sciences, social criticism, and mythology. At the popular level, the discourse about technique contains at least three apparently contradictory intuitions: one is that technique is not morally significant, another is that "something has gone wrong" or that "things have gone too far" in our technical society (technique is morally detrimental), and a third is that technique and technical devices are making our lives better (technique is morally beneficial). These popular perspectives on technique have their counterparts in philosophical and sociological discourse on technique, though consensus in the social sciences seems to be gathering around the opinion that technique is morally significant. This intuition is found already among the sources of western civilization: in Greek mythology and philosophy. It is picked up in the earliest social criticism of the technological era, and continues in the voices of modern religious social critics.[46]

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45 On the problems with the "piecemeal" approach to understanding technique, see Grant, *Technology and Justice*, 34.
46 Though my overview here will be brief, Paul Heidebrecht makes a compelling case for the moral and

Evaluations of Technique in Popular Culture and Mass Media

It is probably fair to say that most people would describe the advances of modern technique as a good thing. The excitement that is aroused any time a new Apple product is announced is a modern example of an optimistic view of technical development. Yet, when pressed, most people will also acknowledge that there are some drawbacks to the advancements that they value so highly. This will often lead to the more nuanced position, also common in popular discourse, that "technology is neither good nor bad; it's how you use it that matters." This view sees technique as morally neutral, ascribing moral significance to the use that humans make of technique. These two positions are the most commonly articulated, but popular discourse about technique also contains a cautious or sceptical position, lying just beneath the surface, often expressed by the same people who are optimistic about technique, and held simultaneously in tension with that optimism. An example of this position in popular culture is the emergence of a counter-discourse with an emphasis on the organic: the search for "organic relationships," an elevation of "organic processes," and the virtual interchangeability of the word "organic" with "authentic."

The optimistic view of technical development in popular discourse is the view associated with advertisers and politicians. Typically, it is said that the present is better than the past because of human achievements in controlling brutal nature through technique. If there are still problems today, well, they aren't as bad as they once were; yet, given enough time, we'll solve those too. Infant mortality is down; life expectancy is up;

theological significance of technology in the first chapter of his dissertation, 'Re-Reading Yoder in Order to Conscientiously Engage Technology Through the Practices of the Church' (Ph.D. diss., Marquette University, 2008).

violence has declined;[47] we have indoor plumbing and refrigeration; we can travel around the world with ease, or we can stay at home and have the world delivered to us. In short, we are living in the best time in human history. If we keep investing in technical discoveries, then the future will be even better. According to this view, the benefits of technique are not entirely dependent on the use that individuals make of it; rather, *technique is a positive force in its own right*. Though individuals may use the power for bad, eventually the beneficial use of techniques is sure to break through. Of course, it would be good if everyone chose positive applications for technique to begin with, but it is not necessary because the benefits outweigh any negative use individuals may make. If there is a need for wisdom, it is to discern *the effectiveness of the means* for the ends that the user has determined, rather than to discern the appropriateness of either the means or the ends themselves. The greatest need is for individuals to be educated on the latest techniques, and how to use them for maximum benefit. This is the operative assumption behind charitable organizations like *One Laptop Per Child*.[48]

Though such an optimistic attitude is common in popular discourse, few actually subscribe to the view in a principled way. Most people, when pressed, will concede that technique has produced a lot of bad results along with the good. A technological dystopia is as likely as a technological utopia, depending on the choices we make as humanity. Since technique can produce both good results and bad, technique is deemed to be neutral, and the moral culpability lies with individuals and the choices they make. This is the "guns don't kill people; people kill people" argument – applied to any situation. "Cars

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47 Steven Pinker, *The Better Angels of Our Nature: Why Violence Has Declined* (New York: Viking, 2011).
48 'Mission | One Laptop per Child', accessed 18 February 2014, http://one.laptop.org/about/mission.

don't hit cyclists, careless drivers hit cyclists. (Or careless cyclists get in the way of

cars.)" "Nuclear power can be harnessed for good instead of evil." Nevertheless, there are

no techniques that should be avoided in principle, only certain uses of technique. So then

wisdom is required to discern *appropriate ends and appropriate means* to those ends,

keeping in mind foreseeable side-effects.

While the optimistic and neutral evaluations of technique are the most articulated

positions in popular culture, there is also a less articulated position which is also

pervasive, even though it is submerged. This more sceptical discourse is a response to the

rational systematization and enframing of reality by technique – a depersonalizing

process which people instinctively reject, even when they lack the language to explain

why. Following the phenomenal rise in popularity of Facebook, a vocal minority of anti-

Facebook critics was formed, even while users of the service began to use terms like

"Facecrack" and joked about being "addicted" to the social network.[49] Various groups

responded to the felt need to limit this technique by issuing a "Facebook Challenge" (to

refrain from Facebook use for 30 days) or committing "Facebook Suicide."[50]

Ecclesiastically, churches that observe Lent began including Facebook alongside

chocolate and caffeine as a possible vice-to-be-sacrificed.[51]

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49 Tom Hodgkinson, 'With Friends Like These... Tom Hodgkinson on the Politics of the People Behind Facebook', News, *The Guardian*, 14 January 2008, http://www.guardian.co.uk/technology/2008/jan/14/facebook.

50 Alicia Vitarelli, 'College Students Give up Facebook for a Month', News, *6abc.com*, 7 February 2011, http://abclocal.go.com/wpvi/story?section=news/local&id=7944617; Guy McMusker, 'Welcome to Seppukoo / Assisting Your Virtual Suicide', *Seppukoo*, accessed 9 February 2011, http://www.seppukoo.com/; moddr_ and Francesco Gamba, 'Web 2.0 Suicide Machine - Meet Your Real Neighbours Again! - Sign out Forever!', *Suicidemachine.org*, accessed 14 April 2011, http://suicidemachine.org/#faq.

51 DAPD/DPA/ka, 'Facebook Becoming Popular Sacrifice for Lent', News, *The Local: Germany's News in English*, 8 March 2011, http://www.thelocal.de/society/20110308-33575.html; Andy Vance, 'Lent, Facebook, and Sacrifice | Andy Vance', 11 March 2011, http://www.andyvance.com/?p=419.

This phenomenon is more than mere distaste for a particular technique or company. Before there was Facebook, there was concern that laptops, mobile phones, PDAs, and pagers (not to mention land-based phone lines) were infringing on people's personal time, diverting them from meaningful pursuits, and increasing their stress by providing continuous access to work. One result is that rules of etiquette have evolved to limit the use of these devices in churches and theatres, at the dinner table, and while driving. One notable example was the Catholic church's statement clarifying that the iPhone is not a valid substitute for physical presence during confession to a priest.[52]

The desire to limit the role of technique in our lives operates at the geopolitical level as well. In North America, debates about pipeline development, expanded use of unmanned aerial vehicles (UAVs or drones), and government surveillance of internet communication raise the question: How far is too far? Globally, climate change is affecting every region of the world, and a solution requires international cooperation at a level never before seen. Climate change, however, is only the latest large-scale global catastrophe precipitated by unrestrained technique. For a time, the more imminent threat was posed by nuclear warfare, while even today, geopolitical manoeuvres such as the American war in Iraq were justified by an appeal to the danger of "Weapons of Mass Destruction." On the other hand, the creation of the Large Hadron Collider (referred to by some in the media as the "Doomsday Collider") revealed widespread public anxiety

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52 Catherine Hornby, 'Catholics Cannot Confess via iPhone: Vatican', News, *Reuters*, 9 February 2011, http://www.reuters.com/article/2011/02/09/us-vatican-iphone-idUSTRE7182XQ20110209; Dan Gilgoff and Hada Messia, 'Vatican Warns about iPhone Confession App', News, *CNN World*, 10 February 2011, http://articles.cnn.com/2011-02-10/world/vatican.confession.app_1_new-app-confession-iphone?_s=PM:WORLD.

about the limits and safety of esoteric techniques and devices.[53]

So whether we are talking about the effects of technique in our personal lives or in global politics, this third, cautious attitude also exists in popular discourse, often hidden and unstated, yet exerting an influence on decisions. For this attitude, technical solutions to problems raise suspicion right from the beginning, and wisdom is required to discern how *technique will change the ends*.

The Moral Significance of Technique in Philosophy and Sociology

"Technology is neither good nor bad; it's how you use it that matters." This turn of phrase expresses well a debate that exists also among the social sciences and technologists. Instrumentalism, the idea that technique is morally neutral, claims that moral judgements apply to ends but not means.[54] Grant takes up this issue when he analyzes the phrase, "The computer does not impose on us the ways it should be used."[55] What he finds is that a computer is not simply a neutral tool which we can use for purposes arrived at separately from technique. Rather, technique is a "package deal." "The coming to be of technology has required changes in what we think is good, what we think good is, how we conceive sanity and madness, justice and injustice, rationality and irrationality, beauty and ugliness."[56]

One of the most influential challenges to the moral insignificance of technique comes from French sociologist Jacques Ellul. Ellul agrees with the principles of

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53 Alan Boyle, 'Atom-Smasher Fears Spark Lawsuit', News, *MSNBC*, 28 March 2008, http://www.msnbc.msn.com/id/23844529/ns/technology_and_science-science/.
54 Paul Grabow, 'An Alternative to Instrumentalism: Technology as a Form of Transcendence', *International Journal of Technology, Knowledge and Society* 4, no. 3 (2008): 197–202.
55 Grant, *Technology and Justice*, 19.
56 Ibid., 33.

instrumentalism as far as the idea that an individual device is neither good nor bad. Indeed, he claims credit for the idea of the neutrality of technique.[57] Nevertheless, his portrayal of technique is often characterized as pessimistic and fatalistic. Though this is not necessarily the best reading of his work, the description appropriately describes how many people feel after reading his work. This is because, for Ellul, the neutrality of technique is not a moral neutrality, but rather a *neutrality in net gain*: the harmful effects of technique cannot be separated from its benefits, so in the final evaluation they cancel each other out. Yet, in addition to this neutrality, technique comes at a price: it involves unintended consequences and it is largely unpredictable.[58] Though many people are aware that technique requires a price, produces unintended consequences, and is unpredictable, these factors are usually balanced against the hope of progress or a belief in the essential positiveness of technique. This hope is what Ellul denies. Rather than arguing for the *moral insignificance* of technique, the neutrality of technique actually helps Ellul to make the case that technique is morally significant, since it is in the region of ambiguity that Ellul believes moral decisions are required.[59]

Albert Borgmann's concept of "the device paradigm" is another important challenge to the moral insignificance of technique. The device paradigm bridges the

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57 Jacques Ellul, *The Technological Bluff* (Grand Rapids, MI: Eerdmans, 1990), xii.
58 Ellul, *The Technological Bluff*.
59 Ellul's thoughts on morality and ethics are particularly complex, even paradoxical, making it difficult to summarize succinctly his conception of the moral significance of technique. For example, his treatise on Christian ethics concludes with "the necessity for a Christian ethic" juxtaposed against "the impossibility of a Christian ethic" Jacques Ellul, *To Will & To Do: An Ethical Research for Christians* (Philadelphia, PA: Pilgrim Press, 1969). Nevertheless, that technique matters for the moral life is clear throughout his work, especially his theological works (e.g., Jacques Ellul, 'Technique and the Opening Chapters of Genesis', in *Theology and Technology: Essays in Christian Analysis and Exegesis*, ed. Carl Mitcham and Jim Grote [Lanham, MD: University Press of America, 1984], 123–37), which were composed intentionally as counterparts to his sociology.

particular (device) and the general (paradigm) in a way that explains the relationship between the use of "neutral" devices and their moral effects. Borgmann conceives of the device paradigm as a way of thinking which transforms "focal things and practices" into devices and commodities. His best known example is that of the fireplace.[60] A fireplace is a "focal thing" because it gathers people together (in the evening for light and warmth), it requires skillful engagement (to keep the temperature consistent, to prevent accidents), and it orders social arrangements (many are involved in the various chores associated with the fireplace). Thus, the fireplace is more than simply an inefficient source of the commodity "heat." It is a focal thing that creates meaning and social cohesion. A central heating system, as an example of a device, requires minimal engagement (even less with the programmable thermostat) and promotes segregation and isolation (people disperse to their rooms, which are effortlessly kept comfortable) as it provides a commodity (heat). Borgmann's analysis argues that devices and the device paradigm are not "bad," and yet they clearly have effects which are of moral concern.

Finally, ecology gives us one of the most accessible challenges to the idea that technique is morally insignificant. Lynn White, Jr.'s seminal essay, "The Historical Roots of Our Ecological Crisis," attributes the modern technique-enabled ecological crisis to historic Christian attitudes toward nature, supported by the biblical injunction to "subdue the earth" (Genesis 1:26-28).[61] On the one hand, modern technique enables the destruction of nature and of everything once considered sacred. On the other hand,

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60 Albert Borgmann, *Technology and the Character of Contemporary Life: A Philosophical Inquiry* (Chicago: University of Chicago Press, 1984), 41–42.
61 Lynn White Jr., 'The Historical Roots of Our Ecologic Crisis', *Science*, New Series, 155, no. 3767 (1967): 1203–7.

modern technique owes its existence to Christian demythologizing/desacralization of nature. These two observations demonstrate to White that modern technique is infused with the moral vice of arrogance or pride toward nature.

> Both our present science and our present technology are so tinctured with orthodox Christian arrogance toward nature that no solution for our ecologic crisis can be expected from them alone. Since the roots of our trouble are so largely religious, the remedy must also be essentially religious, whether we call it that or not.[62]

In this view, technique is inextricably bound to problems which are unavoidably moral. His constructive proposal involves the reinterpretation or reevaluation of traditional religious commitments, guided, for example, by a recovery of St. Francis as the patron saint of ecology.

Ethical Concerns about Technique in Religion-Based Social Criticism

During the technological optimism of the Scientific Revolution, the first major figure to question the value of technique was Jean-Jacques Rousseau. Perhaps the original social critic of technique in modern times, Rousseau's critique stemmed specifically from religious and moral considerations. Though he did not doubt the achievements themselves, he questioned the value of the advancements in the arts and sciences, and maintained that civilization should be judged instead by its achievements in morality and the general happiness of its people.[63] His famous "Discourse on the Sciences and the Arts" anticipates a time when humanity will be able to look back through history and discern its trajectory. Then,

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62 Ibid., 1207.
63 Davis, *Means Without End*, 92–93.

unless they are more foolish than we are, they will throw up their hands to
heaven and will say with a bitter heart: "Almighty God, thou who holds all
spirits in thy hands, deliver us from the enlightenment and fatal arts of our
fathers and give us back ignorance, innocence and poverty, the sole goods
that might create our happiness and which are precious in thy sight."[64]

Rousseau's radical critique is significant for this project not because of its particular

tenets, but rather for its dependance on a religious narrative. We do not need to agree with

Rousseau's evaluation of technique in order to see that Rousseau's criticisms are based on

a religious sensibility. The scientific thinkers of the period (Bacon, Descartes, Newton, et.

al.) were, for the most part, enabled to make their discoveries by separating their

hypotheses as well as their conclusions from religious dogma. Fact was separated from

Value, and Means were separated from Ends. Society was judged to be progressing

because of its increasing ability to describe (and control) the natural world. In this

context, Rousseau insisted that the value of a society could only be judged by its

achievements in morality, and in particular by its capacity for compassion.

More recently, at least two books by disillusioned secular philosophers have

extolled the value of simplicity, which they find in manual labour and in "unplugging"

from technique.[65] Yet within the Christian tradition, this impulse is as old as the desert

fathers and mothers, and has been been preserved by monastic disciplines and the

lifestyle of various renewal movements, including early anabaptism and modern Amish

communities.[66] It is important, therefore, that theology also discover a way to incorporate

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64 Jean-Jacques Rousseau, *The Major Political Writings of Jean-Jacques Rousseau: The Two Discourses
    and the Social Contract*, trans. John T. Scott (Chicago, IL: The University of Chicago Press, 2012), 34.
65 Matthew Crawford, *Shop Class As Soulcraft: An Inquiry into the Value of Work* (New York: Penguin
    Press, 2009); Eric Brende, *Better Off: Flipping the Switch on Technology* (New York, NY:
    HarperCollins, 2004).
66 Donald B. Kraybill, *The Riddle of Amish Culture* (Baltimore, MD: Johns Hopkins University Press,
    1989); see also Heidebrecht, 'Re-Reading Yoder', 49–57.

these emphases in its discussions of technique.

For religious social critics today, the concept of limits is a motif that runs throughout the discourse on technique. In his political theology and in his bioethics, Stanley Hauerwas argues for an ethic of humility that embraces suffering as a normal part of Christian discipleship.[67] He questions the biomedical desire for "self-improvement" and proposes *virtue ethics* (fostered in a community of character) as a limit to the politics of self-interest, in which a concept of a common good (as an end) plays little or no role, and in which self-interest functions as the correct means for producing whatever can be called the common good. So, he suggests, "The first social task of the church is to provide the space and time necessary for developing skills of interpretation and discrimination sufficient to help us recognize the possibilities and limits of our society."[68] Similarly, Albert Borgmann and Richard Gaillardetz each propose a certain asceticism by way of engagement with focal things (especially liturgy) as necessary to the search for God in a technological society.[69] Marva Dawn links the recovery of hope in a technological milieu specifically to the focal practice of baptism and a life limited by divine law.[70] Lynn White, Jr. characterizes the current ecological problem as one of

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67 Stanley Hauerwas, 'Anabaptist Eyes on Biotechnology', in *Viewing New Creations with Anabaptist Eyes: Ethics of Biotechnology*, ed. Roman J. Miller, Beryl H. Brubaker, and James C. Peterson (Telford, PA: Cascadia, 2005), 243–53; Stanley Hauerwas, *Suffering Presence: Theological Reflections on Medicine, the Mentally Handicapped, and the Church* (Notre Dame, IN: University of Notre Dame Press, 1988); see also Stanley Hauerwas, *A Community of Character: Toward a Constructive Christian Social Ethic* (Notre Dame, IN: University of Notre Dame Press, 1981).

68 Hauerwas, *A Community of Character*, 74.

69 Albert Borgmann, *Power Failure: Christianity in the Culture of Technology* (Grand Rapids, MI: Brazos Press, 2003); see also Albert Borgmann, 'Contingency and Grace in An Age of Science and Technology', *Theology Today* 59, no. 1 (2002): 6–20; Richard R. Gaillardetz, *Transforming Our Days: Spirituality, Community and Liturgy in a Technological Culture* (New York, NY: Crossroad Publishing Company, 2000).

70 Marva Dawn, *Unfettered Hope: A Call to Faithful Living in an Affluent Society* (Louisville, KY: Westminster John Knox Press, 2003), 153–182.

arrogance toward nature, and proposes a recovery of the virtue of humility as modelled by St. Francis.[71] Wendell Berry advocates a rootedness in the particular and the local as a necessary limit to the technological culture of utility, consumption, and domination.[72] Arthur Boers describes spiritual disciplines, in particular walking and pilgrimage, as a balm for the ills of modern technological society.[73] As a group, the proposals of authors in this vein highlight the need for theology to grapple more deeply with technique than it has thus far.[74]

The Limits of Technique in Greek Myth and Worldview

Christian ethicists are by no means pioneers in their engagement with technique: the evaluation of technique has always been a religious task. In the Western tradition, going back at least as far as the ancient Greeks, religious myths have always given orientation to people as they relate to technique. Perhaps the most famous is the myth of Prometheus. Prometheus, whose name literally means "Forethinker," favoured humanity

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71 White, 'The Historical Roots of Our Ecologic Crisis', 1206.
72 Wendell Berry, *Life Is a Miracle: An Essay Against Modern Superstition* (Washington, D.C.: Counterpoint, 2000); Wendell Berry, 'Feminism, the Body, and the Machine', *Cross Currents* 53, no. 1 (2003): 32–47. On the role of limits in politics, see, Wendell Berry, *The Way of Ignorance: And Other Essays* (Emeryville, CA: Shoemaker & Hoard, 2005); Wendell Berry, *The Work of Local Culture*, Iowa Humanities Lecture (Great Barrington, MA: E.F. Schumacher Society, 1988); and Wendell Berry, *The Gift of Good Land: Further Essays, Cultural and Agricultural* (San Francisco: North Point Press, 1981).
73 Arthur P. Boers, *The Way Is Made by Walking: A Pilgrimage Along the Camino De Santiago* (Downers Grove, IL: InterVarsity Press, 2007); see also Arthur P. Boers, 'Walking Lessons: The Practice of Pilgrimage', *Christian Century* 124, no. 26 (2007): 22–26; John Shorb, 'Walking as a Focal Practice: Q&A with Arthur Paul Boers', *Church Health Reader*, 2009, http://www.hopeandhealing.org/contentPage.aspx?resource_id=324.
74 Brad J. Kallenberg, *God and Gadgets: Following Jesus in a Technological Age* (Eugene, OR: Cascade, 2011); Murray Jardine, *The Making and Unmaking of Technological Society: How Christianity Can Save Modernity from Itself* (Grand Rapids, MI: Brazos Press, 2004); Quentin Schultze, *Habits of the High-Tech Heart: Living Virtuously in the Information Age* (Grand Rapids, MI: Baker Academic, 2002); Quentin Schultze, *High-Tech Worship?: Using Presentational Technologies Wisely* (Grand Rapids, MI: Baker Books, 2004); Kathleen Cahalan, 'Temperance and Technology', *Chicago Studies* 41, no. 1 (2002): 26–35; Alan R. Drengson, 'The Sacred and the Limits of the Technological Fix', *Zygon* 19, no. 3 (1984): 259–75.

and so stole fire from the gods and gave it to humanity. There are several versions of the story, the most important found in Hesiod's *Theogony*, Aeschylus' *Prometheus Bound*, and Plato's *Protagoras*. In Hesiod's version, which is the earliest, humanity possesses fire, but Zeus retracts it and the "means of life" in retribution for Prometheus' trickery. When Prometheus returns the fire, Zeus has him chained to a rock to be eaten daily by an eagle as punishment, and also creates Pandora to plague humanity. The moral: "Thus it is not possible to deceive or elude the mind of Zeus. For not even Iagetus' son, guileful Prometheus, escaped his heavy wrath, but by necessity a great bond holds him down, shrewd though he be."[75] Throughout Aeschylus' play, Prometheus does not only steal fire, but claims responsibility for teaching humanity all of the civilizing arts, as well as preventing Zeus from destroying humanity. Prometheus is presented not as a warning (as in Hesiod) but as a tragic rebel-hero. In Plato's version, Prometheus steals the art of working fire from Hephaestus, the god of the forge, and other techniques from Athena, the goddess of wisdom or craftiness and of war. He does this to compensate for the mistake of his brother Epimetheus (Afterthinker), who gave all the gifts of survival to the animals but not to humanity.[76] The gifts of Prometheus thus provided the wisdom or craft required for humanity to sustain life individually. They did not, however, provide the political wisdom required for humanity to co-exist in communities and become civilized. Later, says Plato, the human race in their isolation from each other were at risk of destruction by the animals, so Zeus granted to humanity the greater virtues of justice and reverence that allow political communities to exist. It was these gifts that allowed

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75 Hesiod, *Theogony* 613-616.
76 Plato, *Protagoras* 320d-322a.

humankind to flourish and prosper in a way that nature would never have permitted, given the general frailty of humans in their natural state.

So the poets' and the philosophers' evaluations of Prometheus' gift of technique were mixed. According to Hesiod, it was Prometheus' trickery that lead Zeus to conceal fire – along with "the means of life" – in the first place. The return of the fire by Prometheus was thus poor repayment for the loss of "the means of life," which would have allowed humans to accomplish in one day of work all that was necessary to live for one year. However, in Aeschylus' version of the story, it was Zeus' intention to destroy the human race (as he had destroyed five previous mortal races). Prometheus thus emerged as humanity's champion by thwarting Zeus' plans, while the gift of technique was at least partially responsible, as it gave humans an advantage against natural forces which would previously have ruined them. In Plato's version, the gifts of Prometheus are of limited value: they enable humanity's survival, but the greater gifts come from Zeus.

A second important myth about technique is that of Icarus. In this story, a master craftsman, Daedalus, and his son, Icarus, were imprisoned on Crete. Daedalus constructed wings for his son and himself in order to escape. As they prepared to leave, Daedalus instructed Icarus not to fly too high, which would cause the wax to melt and destroy the wings, nor too low, which would cause the wings to become heavy with moisture and cause him to sink into the sea. The boy, however, became thrilled by flight and soared higher and higher, ignoring his father's warning until it was too late and the wings had disintegrated. This myth expressed well the Greek attitude toward life in general: namely, the ideal of harmony and balance in all things. As it pertains to

technique, though, it even more clearly expressed a concern for technical limits – the ideal of flying neither too high nor too low.

The mythological understanding of technical limits gave expression in dramatic form to a worldview that was also held by the Greek philosophers. This worldview considered technique to be neutral at best; at worst, it was a distraction from the attainment of true happiness (e.g., through philosophy). To the best of our knowledge, there was no view among the philosophers which saw technique as a good in itself. For this reason, technique could never have become, for the philosophers, an end in itself.[77] Rather, the development and use of technique were always constrained by the worthiness of the *ends to which technique was applied*. Although examples of this worldview can be found throughout the Greek philosophers, they are perhaps most clearly discerned in Plato. Plato's location of ultimate reality and true happiness in the realm of the Ideal discouraged philosophers from "dirtying their hands" with the manipulation of nature through *techne*, since nothing of permanence could be gained thereby.[78] Indeed, the opposite occurred in the case of Archimedes, the famous mathematician who, though he was highly successful as an engineer, began to despise utility and profit and gave up his engineering practice in order to study geometry and philosophy.[79] Plato's disciple, Aristotle, took a more positive view of material reality, and yet he also considered *techne* to be inferior to philosophy. However, Aristotle's judgement was based not on the inferiority of its subject matter, but on the subservient nature of technique itself. Aristotle

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77 Mitcham, 'Philosophy and the History of Technology', 186.
78 Davis, *Means Without End*, 11–16.
79 Ibid., 15; Elspeth Whitney, 'The Mechanical Arts in the Context of Twelfth- and Thirteenth-Century Thought' (Ph.D. diss., City University of New York, 1985), 50.

understood *techne* as always serving some other *telos*; thus, its essence was inferior to the

essence of philosophy, which contains within itself its own *telos*.[80]

THEOLOGICAL PARTICIPATION IN TECHNOLOGY

Despite the vibrant conceptions of technique in ancient Greek mythology and

philosophy, historically theology has not often discussed technique. Perhaps part of the

reason is that, for most of Christian history, technique has developed so slowly that it did

not draw attention to itself as a particularly notable feature of human life. Technology

was not studied systematically as a discipline; rather, techniques were developed almost

by accident. Yet for a long time, even after the age of science had begun and technology

began to be studied, theology continued to ignore its significance.[81] This changed early in

the twentieth century, when Paul Tillich's and Martin Heidegger's respective treatments of

technique offered two ways for theology to proceed.[82] Tillich used the word "technology"

to refer broadly to both instrument and symbol. For Tillich, technology was but one

factor (alongside capitalism and mathematical science) influencing the "world situation."

Tillich was interested primarily in understanding the "world situation," and technology

was one important piece in that puzzle.

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80 Davis, *Means Without End*, 5–6.
81 This is not to discount the notable work which has been done on medieval theologies of technique, which is uncovering a significant, though often overlooked, area of medieval theological inquiry. See Whitney, 'The Mechanical Arts in the Context of Twelfth- and Thirteenth-Century Thought'; Elspeth Whitney, 'Paradise Restored. The Mechanical Arts from Antiquity through the Thirteenth Century', *Transactions of the American Philosophical Society* 80, no. 1 (1990): 1–169. See also, Lynn White Jr., *Medieval Religion and Technology: Collected Essays* (Berkeley, CA: University of California Press, 1978); George Ovitt, 'The Cultural Context of Western Technology: Early Christian Attitudes toward Manual Labor', *Technology and Culture* 27, no. 3 (1986): 477–500; Ernst Benz, *Evolution and Christian Hope: Man's Concept of the Future from the Early Fathers to Teilhard De Chardin* (Garden City, NY: Doubleday, 1966). Yet, these are hardly dominant themes throughout the history of theology.
82 Paul Tillich, *The Spiritual Situation in Our Technical Society*, ed. J. Mark Thomas (Macon, GA: Mercer University Press, 1988); Martin Heidegger, *The Question Concerning Technology, and Other Essays* (New York, NY: Harper & Row, 1977).

Heidegger approached "technology" differently, however. He understood the essence of technology to be bigger than just one piece influencing the world situation; technology operated at the level of "enframing" and "revealing." According to Heidegger, the *enframing* of technology *reveals reality* by organizing and structuring it, thereby closing up human freedom. Given a choice between these two distinct approaches toward technique, theology has generally followed Tillich in subordinating it to socio-political concerns. In most theological discourse, technique is treated as one piece in the bigger puzzle of the "world situation," rather than as the frame which surrounds the entire puzzle, as Heidegger described. Yet, even though Heidegger's analysis of technique has not found much purchase within theological discourse, the tradition of Heidegger persists and has been developed into a specialty by various non-religious disciplines such as philosophy and sociology.

This was the situation for most of the twentieth century, but in the late twentieth century and early twenty first, technique has actually begun to receive increasing theological treatment. Part of the reason for this shift is that the questions and the problems have changed. The problem of the early twentieth century, i.e., of Heidegger, Tillich, *et al.*, could be described as the problem of a *technical environment*. They were interested in the effects of technique on the present, on the world situation, on reality. However, in more recent theological discourse the question has shifted to that of a *technical eschaton*. Though the roots of this approach can also be traced to the early twentieth century in the body of writings by Pierre Teilhard de Chardin, he remained a marginal voice, and his perspective did not really begin to shape the discourse on

technique until later in the twentieth century. The Teilhardian interest in technique

focuses on the ways that technical progress can be leveraged for human benefit in the

eschatological future. The theological contribution of Teilhard de Chardin to technology

has been to ask questions about appropriate goals (e.g. love, or "amorization") and to

connect visions of the technical future with theological discussions about the purposes of

God.

Describing the Environment

The major works that come up in any theological study of technique include

Heidegger's series of lectures, compiled as *The Question Concerning Technology* and

Tillich's various articles, collected in *The Spiritual Situation in our Technical Society*. In

Heidegger's treatment, technical artifacts are completely irrelevant, except as

instantiations of the idea of "technology." Heidegger's primary interest is in describing

the essence of "technology," which he identifies as *enframing*. Enframing functions as

one way of revealing. What is significant about enframing is that, as a way of revealing,

it is all-encompassing. It tends, by nature, to include everything in its system. Secondly,

because enframing proceeds by rational systematization, it closes up human freedom by

locking things and ideas into logical connection with each other. This lead to two

preeminent questions in subsequent discussions of technique: "Is technique

autonomous?" and, "Is technique beneficial?" The conclusion of the titular series of

lectures suggests Heidegger's answers to these questions: technique is autonomous, and it

is not entirely beneficial. Indeed, here Heidegger moves beyond description and into

prescription as he posits the possibility that art, as another child of *techne*, can offer an

alternative way of revealing that proceeds not by enframing but by a direct uncovering of a being's essence.

Tillich's discussion, like Heidegger's, is primarily descriptive. For Tillich, "technology" is everywhere, and in every act, including those of "nature." Therefore, technique itself is not a problem so much as the particular mode of technique in the modern era – what he terms "transforming technology," which exists alongside "developmental technology" and "actualizing technology." "Transforming technology" is unique because it destroys materials foreign to its purpose in the service of its purpose.[83] Yet, as this aspect of technique becomes more prominent, the importance of "means" also increases to the point that modern society is determined by "the methods and organization of industry." As a result, the technical society is one in which means have become ends in themselves. Although Tillich expressly adopts description as his strategy, his work implies also a hope that such description will uncover the meaning of our age as well as the appropriate response to it.[84]

Barbour's series of Gifford Lectures, published in two volumes as *Religion in an Age of Science* and *Ethics in an Age of Technology*, is an important landmark in the description of technique.[85] In *Ethics*, Barbour begins by developing a three-part typology of "technology as liberator," "technology as threat," and "technology as instrument of power."[86] He concludes that technology is best understood as an instrument of power, which includes both threatening and liberating aspects. The remainder of *Ethics* assumes

83 Tillich, *The Spiritual Situation in Our Technical Society*, 53–54.
84 Ibid., xvii.
85 Ian G. Barbour, *Ethics in an Age of Technology*, vol. 2, 2 vols., Gifford Lectures 1989-1991 (London: SCM Press, 1992).
86 Ibid., 2:3–4.

this understanding of technology. Barbour's next-to-last chapter is on "Controlling Technology," and Barbour demonstrates that he believes technique needs to be managed for positive purposes.[87] So in *Ethics*, the two questions raised by Heidegger's work are answered in another way: technique is not autonomous, and technique can be used for both good and evil. Though *Ethics* does not comment on the meaning of our age, its response to the questions raised by Tillich's work is to offer a possible and compelling vision of an appropriate response to technique. Technique can be controlled by governments and change can occur through education, political action, the influence of various crises, and a vision of alternatives. In an "age of technology," ethics are necessary because of the great potential for both good and evil.

Though his description of technique was not entirely new, Barbour's typology has been important because it has allowed theology to move beyond descriptions (in the mode of Tillich and Heidegger) of technique and into ethics. By positioning his idea of the "instrument of power" between the extremes of a "pessimism" in which no ethic is possible and an "optimism" in which no ethic is necessary, Barbour was able to connect his description of technique with a programme of action. Barbour's typology or some modification of it[88] has now become standard in theological discussions of technique.[89]

As a result of the work of Heidegger, Tillich, and Barbour, technique is a common motif in theology today. Almost any theology of culture must include a reference to

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87 Ibid., 2:213–241.

88 Robert John Russell, 'Five Attitudes Toward Nature and Technology from a Christian Perspective', *Theology and Science* 1, no. 2 (2003): 149.

89 See White, *Christian Worship and Technological Change*, 23ff. See also the recent doctoral dissertations by Stephen Robert Garner, 'Transhumanism and the Imago Dei: Narratives of Apprehension and Hope' (Ph.D. diss., University of Auckland, 2006), 22ff; James Alan Fenimore, Jr., 'How a Congregation's Identity Is Affected by the Introduction of Technology-Based Ministries' (Ph.D. diss., Drew University, 2001), 8ff.

"technology" somewhere. Even works that are not directly about technique or culture still have to deal with the changing context of theology in a technical environment: theological discourse has changed because of innovations as simple as chapter headings and indexes, while the impact of a world-wide conversation enabled by a global communications network is only beginning to be felt. Whether it is recognized or not, technique has had an impact on the way in which theology is done.[90]

The motif of technique occurs most often in theological descriptions of culture. Technical methods are important when theology discusses the transmission of the gospel into culture, the work of God in the world, or the relevance of Christ for any of a number of social issues, including poverty and justice, war and peace, or morality and values. Theologians find it helpful to take technique into account when addressing these various cultural issues, but their purpose in talking about technique is merely to describe it – especially as it relates to their given topic. Authors such as Douglas John Hall,[91] William Cavanaugh,[92] Duane Friesen,[93] John Stackhouse, Jr.,[94] Oliver O'Donovan,[95] Mark

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90 For a discussion of the role of the internet in particular, see Paul A. Soukup, Francis J. Buckley, and David C. Robinson, 'The Influence of Information Technologies on Theology', *Theological Studies* 62, no. 2 (2001): 366–77.

91 *Thinking the Faith: Christian Theology in a North American Context* (Minneapolis, MN: Augsburg Fortress, 1989).

92 'The World in a Wafer: A Geography of the Eucharist as Resistance to Globalization', *Modern Theology* 15, no. 2 (1999): 181–96.

93 *Artists, Citizens, Philosophers: Seeking the Peace of the City: An Anabaptist Theology of Culture* (Waterloo, ON: Herald Press, 2000).

94 *Making the Best of It: Following Christ in the Real World* (New York, NY: Oxford University Press, 2008).

95 *Begotten or Made?: Human Procreation and Medical Technique* (New York, NY: Oxford University Press, 1984); *Common Objects of Love: Moral Reflection and the Shaping of Community: The 2001 Stob Lectures* (Grand Rapids, MI: Eerdmans, 2002); see also Oliver O'Donovan and Joan Lockwood O'Donovan, *Bonds of Imperfection: Christian Politics, Past and Present* (Grand Rapids, MI: Eerdmans, 2004).

Wallace,[96] Stanley Hauerwas,[97] and Marva Dawn,[98] continue to reference technology as an aspect of the world (one piece of the puzzle) that needs to be addressed by their social ethics. Their concerns generally take the following form: "What should we do about *poverty* in a technological society?" or "How can we increase a sense of *community*, or *justice*, in a technological society?"

Imagining an *Eschaton*

The one area in which theology goes beyond description is in discussions of "fringe technology." What I am calling "fringe technology" is that broad area of technology that deals with problems which are not yet parts of everyday discourse or use. It includes such issues as artificial intelligence, cloning, experimental medical techniques, nuclear energy, some forms of ecology, and future technique. What unites these areas of concern under one heading is that they belong to the domain of the specialist; in other words, they are on the "fringe" of public experience and perception. Though many of the issues they raise are of public concern, and the public may have strong opinions about them, in these areas agendas are set and decisions are controlled by the specialist. Theological discourse on these topics typically proceeds either by appealing directly to the specialist or by influencing the public to pressure elected officials who control the specialist's funding. Alternatively, theologians must become specialists themselves, or vice versa. So, on the one hand, pastors and laypersons sign petitions and form lobby groups, and, on the other hand, there are academic journals and high level

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96 *Fragments of the Spirit: Nature, Violence, and the Renewal of Creation* (New York, NY: Continuum, 1996).
97 *A Community of Character.*
98 *Unfettered Hope*.

interdisciplinary conferences on Christian bioethics.

Theological participation in fringe technology tends to be more optimistic than social criticism of present-day techniques. The focus on the future in these discussions presents technique, often explicitly, in an eschatological light. The "already" possibilities of fringe technique seem to awaken theological hope, while the "not yet" of the dangers seems to diminish the perception of risk.[99] Yet, as a result of their optimism toward techniques of the future, theologians have been able to move beyond a primarily philosophical and methodological analysis and have begun to engage technique on its own level – that is, at the level of the device, which Heidegger had previously deemed insignificant. The authors in this vein have begun to think theologically about computer-brain interfacing, genome manipulation, and the internet. This process was greatly assisted by Philip Hefner's concept of the "created co-creator" and Niels Gregersen's "autopoiesis," which provided theological terminology for a view that was already common in the broader religion-and-science discussion. It is also inspired by Teilhard de Chardin's evolutionary theology.

In the early twentieth century, Teilhard de Chardin provided what has been perhaps the most outstanding and original of theological engagements with fringe

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99 For examples of this trend, see Noreen Herzfeld, 'Terminator or Super Mario: Human/Computer Hybrids, Actual and Virtual', *Dialog: A Journal of Theology* 44, no. 4 (2005): 347–53; Stephen Robert Garner, 'Hacking with the Divine: A Metaphor for Theology-Technology Engagement', *Colloquium* 37, no. 2 (2005): 181–95; Gregory R Peterson, 'Imaging God: Cyborgs, Brain-Machine Interfaces, and a More Human Future', *Dialog: A Journal of Theology* 44, no. 4 (2005): 337–46; Ted Peters, 'Hybrids & Human Integrity: Christian Anthropology and the Post-Human Future', *Dialog: A Journal of Theology* 44, no. 4 (2005): 336–95; Barbara Strassberg, 'Magic, Religion, Science, Technology, and Ethics in the Postmodern World', *Zygon* 40, no. 2 (2005): 307–22; Charles P. Henderson, 'The Internet as a Metaphor for God?', *Cross Currents* 50, no. 1–2 (2000): 77–83. Within religious studies more generally, see Rachel Wagner and Frances Flannery-Dailey, 'Wake up! Worlds of Illusion in Gnosticism, Buddhism, and The Matrix Project', in *Philosophers Explore The Matrix*, ed. Christopher Grau (New York, NY: Oxford University Press, 2005), 258–87.

technique. As a Jesuit and an evolutionary biologist, Teilhard de Chardin developed a theology of progress leading toward the eventual eschatological perfection of humanity and the world. Key to this development was his concept of a "noosphere," a region of influence formed by the existence and pooling of self-conscious minds. The noosphere was the historical product of the geosphere and the biosphere. For Teilhard de Chardin, just as biological existence (the biosphere) builds upon and transforms the geological world (the geosphere), so self-conscious existence (the noosphere) builds upon and transforms both biological and geological reality. (In some cases, the noosphere is seen as realized in the Internet, which makes Teilhard de Chardin's eschatological vision seem to be partially fulfilled.) Self-consciousness was important to his cosmology because it allowed for reflection, a turning back upon oneself. Ultimately, Teilhard de Chardin believed that this reflection would result in the Omega Point, a time when a self-conscious noosphere, or "Collective Christ," having reached the limits of organized complexity, would choose to reduce itself to a singular consciousness, or "Christ Personal." As the sole observer of the universe, this single consciousness would also be the sole organizer of the universe on a quantum mechanical level; the universe would effectively become the "cosmic body" of the Christ Personal.

Scientific and technical development were crucial to Teilhard de Chardin's controversial vision of human fulfilment in the Omega Point. He believed that God was at the centre of history and the universe, pulling humanity toward the Omega Point through the processes of evolution. Indeed, the technical discovery of fire was indispensable for the evolution of the mind itself. For Teilhard de Chardin, it was

humanity's destiny to make and to understand, so that even love may become a force amenable to technical control. "The day will come when, after harnessing the ether, the winds, the tides, gravitation, we shall harness for God the energies of love. And, on that day, for the second time in the history of the world, man will have discovered fire."[100] For this reason, Teilhard de Chardin has sometimes been considered a process theologian, although his theology is also existentialist and evolutionary.[101]

After Teilhard de Chardin and until the end of the twentieth century, theological discussions of fringe technique focused mainly on biomedical issues. This involved the well-known problems of genetic engineering, stem-cell research, end-of-life considerations and various other ethical concerns. Though the standard response to these questions by theologians was typically cautious,[102] recently a new wave of theologians, including Philip Hefner, Willem Drees, Ronald Cole-Turner, and James Peterson, have embraced biotechnology as an appropriate expression of human creativity.[103] Based in

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100 Pierre Teilhard de Chardin, 'The Evolution of Chastity', in *Toward the Future* (New York, NY: Harcourt Brace Jovanovich, 1975), 86–87. See also Pierre Teilhard de Chardin, *The Phenomenon of Man* (London: Collins, 1965).

101 A. O. Dyson, 'Teilhard de Chardin, Pierre', ed. Alan Richardson, *A Dictonary of Christian Theology* (London: SCM Press, 1969); Ismael Garcìa, 'Teilhard de Chardin, Marie-Joseph-Pierre (1881-1955)', ed. Justo L. González, *The Westminster Dictionary of Theologians* (Louisville, KY: Westminster John Knox Press, 2006).

102 For example, see John Breck, 'Bio-Medical Technology: Of the Kingdom or of the Cosmos?', *St. Vladimir's Theological Quarterly* 32, no. 1 (1988): 5–26; Audrey R. Chapman, 'Genetic Engineering and Theology: Exploring the Interconnections', *Theology Today* 59, no. 1 (2002): 71–89; Celia Deane-Drummond, 'Fabricated Humans? Human Genetics, Ethics and the Christian Wisdom Tradition', *Dialog: A Journal of Theology* 44, no. 4 (2005): 365–74; Gerald P. McKenny, 'Technologies of Desire: Theology, Ethics, and the Enhancement of Human Traits', *Theology Today* 59, no. 1 (2002): 90–103; Gerald P. McKenny, *To Relieve the Human Condition: Bioethics, Technology, and the Body* (Albany, NY: University of New York Press, 1997).

103 Philip J. Hefner, 'The Evolution of the Created Co-Creator', *Currents in Theology and Mission* 15, no. 6 (1988): 512–25; Philip J. Hefner, 'Technology and Human Becoming', *Zygon* 37, no. 3 (2002): 655–65; Willem B. Drees, '"Playing God? Yes!": Religion in the Light of Technology', *Zygon* 37, no. 3 (2002): 643–54; Willem B. Drees, *Technology, Trust, and Religion: Roles of Religions in Controversies on Ecology and the Modification of Life* (Leiden: Leiden University Press, 2009); Ronald Cole-Turner, *Pastoral Genetics: Theology and Care at the Beginning of Life* (Cleveland, OH: Pilgrim Press, 1996); Ronald Cole-Turner, *Genetics and Theology: The Anxiety of Change and the Humility of Hope* (Oxford:

part on incarnational theology and certain interpretations of the *imago Dei*, this approach

asserts that "playing God" is actually a part of human destiny or purpose.[104] Thus, it

optimistically directs biomedical technology toward the goals of transhumanism and the

post-human. A bold but characteristic example comes from H. Tristram Engelhardt, the

current editor-in-chief for *Christian Bioethics*:

> There are no overbearing reasons to maintain human nature as it is,
> uncontaminated by manufactured genes or by genes from other species.
> Human nature as a cluster of inherited capacities is no more inviolate than
> it is secure from mutations. We as persons cannot step outside of genetic
> constraints, but we can change or alter those constraints. Over the long run
> we are likely to do that and in so doing revise human nature better to meet
> the goals of persons. Then the issues will not be simply moral, but
> aesthetic as well. We will need to remember to do not only what is good,
> but also what is beautiful.[105]

This passage exemplifies a major theme within theological bioethics: the inevitability of

technical progress. As this line of thinking argues, the best that individuals can do is try to

direct technique toward acceptable ends.

The theological terms, "created co-creator" and "autopoiesis" were introduced by

theologians in conversation with evolutionary biology and systems theory. In the context

of evolutionary biology, the terms refer to the self-transformation of the human species as

a whole. As an interpretation of Genesis 1-2, the concept of the created co-creator

Harris Manchester College, 1996); Ronald Cole-Turner, ed., *Human Cloning: Religious Responses* (Louisville, KY: Westminster John Knox Press, 1997); Ronald Cole-Turner, ed., *Beyond Cloning: Religion and the Remaking of Humanity* (Harrisburg, PA: Trinity Press International, 2001); Ronald Cole-Turner, ed., *Design and Destiny: Jewish and Christian Perspectives on Human Germline Modification*, Basic Bioethics (Cambridge, MA: MIT Press, 2008); James C. Peterson, *Genetic Turning Points: The Ethics of Human Genetic Intervention* (Grand Rapids, MI: Eerdmans, 2001).

104 Drees, 'Playing God? Yes!'. See also Patrick D. Hopkins, 'Protecting God from Science and Technology: How Religious Criticisms of Biotechnologies Backfire', *Zygon* 37, no. 2 (2002): 317–43; H. Tristram Engelhardt, 'Persons and Humans: Refashioning Ourselves in a Better Image and Likeness', *Zygon* 19, no. 3 (1984): 281–95.

105 Engelhardt, 'Persons and Humans', 294.

suggests that a part of human nature is to create as God creates and in participation with

God.[106] Autopoiesis contributes to this understanding by articulating *how* humans

participate in creation: autopoiesis is the ability of systems to produce genuinely new

features within themselves, which is more than simply self-organization but not quite

self-creation, since the origin of the system requires external input.[107] Theological

justification for these concepts is based on *kenosis*, the idea of God's self-limitation. They

are also inspired by Teilhard de Chardin's eschatological speculations, particularly about

the evolution of a "noosphere" of human consciousness.[108] In general, these concepts

have helped to describe and rehabilitate a positive view of human progress, which had,

following two world wars, fallen out of favour.

The terms "autopoiesis" and "created co-creator" are useful in the field of

bioethics, but also in the emerging discussion around cybernetics. Biotechnology

represents a modern, self-aware version of "co-creation," where the genetic modification

of individuals has an inevitable effect on the evolution of the entire species. Cybernetics,

or human-machine interfacing, has a similar effect on a macroscopic level, though it has

evoked less controversy. This is partially because the field is so new, but also because it is

seen to involve fewer ethical dilemmas: the cyborg, being a conscious adult, is capable of

taking responsibility in a way that a zygote is not. As many already note, cybernetics is

not a thing of the future: we already have pacemakers, hearing aids, artificial and robotic

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106 Hefner, 'The Evolution of the Created Co-Creator'.

107 Niels Henrik Gregersen, 'The Idea of Creation and the Theory of Autopoietic Processes', *Zygon* 33, no. 3 (1998): 333–67; Niels Henrik Gregersen, 'Autopoiesis: Less than Self-Constitution, More than Self-Organization', *Zygon* 34, no. 1 (1999): 117–38.

108 Philip J. Hefner, *The Promise of Teilhard: The Meaning of the Twentieth Century in Christian Perspective* (Philadelphia: Lippincott, 1970); See also Pierre Teilhard de Chardin, *The Future of Man* (New York, NY: Harper & Row, 1964); Teilhard de Chardin, *The Phenomenon of Man*.

limbs, smart phones, and search engines that can predict our preferences (e.g., Google, Amazon, or iTunes). In these areas, the line between person and tool is increasingly being blurred as we increasingly offload certain human functions onto devices.[109] Yet theological discussion and evaluation of transhumanism often ignores these features, except to note their *a priori* existence as justification for the transhumanist project in general. Rather, theologians direct their inquiries toward the techniques of the future, a technological eschaton.

Theological participation in fringe technology is important as the one area in which theology typically goes beyond description and sets some kind of normative values. What is missing in theological discussions of fringe technique, both biological and cybernetic, is the real possibility of popular engagement or control of the discourse. These areas are dominated by the specialist (both research scientists and commercial interests) and usually enter the public domain only as consumer products. By that point, the real ethical decisions have been made; all that is left is the choice to consume or not to consume. Furthermore, the majority of theologians who are capable of engaging the scientific aspects on their own terms see no need to analyze the discourse about technique, since their language is already governed by the grammar of technology (that is, of control and efficiency).

CONCLUSION

In this chapter, I examined the ethical and moral significance of technique in popular culture and mass media, in philosophy and sociology, in religion-based social

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109 Garner, 'Transhumanism and the Imago Dei'; see also Brent Waters, 'What Is Christian about Christian Bioethics?', *Christian Bioethics* 11, no. 3 (2005): 281–95.

criticism, and in ancient Greek myth and worldview. I then described the two main ways in which Christian theology itself participates in technology. In summary, popular culture recognizes a need to use moral discretion regarding technique. Philosophy and sociology have identified various ethical and moral issues connected to technique. Modern social critics cite religious reasons for their evaluations of technique or they articulate religious responses to technique. Ancient cultures found a place for technique within their cosmologies, and thus prescribed it a limited role in society. All of these are good reasons for theology to engage with technology. Yet theological engagement with technology primarily takes only two modes: describing the current state of the technological society, or imagining a future technological society. It is my contention that theology needs to delve more deeply beneath the surface to think about the *meaning* of technique – to formulate powerful cosmologies, like those in ancient Greece, that include technique.

One way to delve beneath the surface and uncover the meaning of technique is by analyzing the spirit of technique. Spirit pertains to the essence of a thing, rather than its appearance. Therefore, an analysis of the spirit of technique moves beyond the superficial to the heart of technique. In the next chapter, I survey some of the current uses of spirit-language by technology in order to show that spirit is indeed relevant to technology.

CHAPTER 3:
THE GHOSTS IN THE MACHINE: USES OF SPIRIT-LANGUAGE BY TECHNOLOGY

In the previous chapter, I described typical approaches to theological engagement with technique. These can be summarized in two movements: first, as describing the technological environment, and, second, as imagining a technological eschaton. Both of these are important theological modes; the problem is that theology has allowed technology to define itself. Theology has not brought its own language to the table, and so it has largely functioned to add a religious veneer to technology. In this way, theology relinquishes its critical function.

As the previous chapter showed, there are many areas of overlap between technology and theology. Attempting to address all of them is far beyond the scope of this project. For example, theology has already begun to engage technology on such themes as creation, incarnation, eschatology, and ethics. However, one area in which theological engagement is less developed is in the area of pneumatology. Engaging with the spirit-language in technology is important because it allows us to move beyond the atomized focus on individual devices or techniques and to look at technique as a whole, without reducing it to a superficial simplicity.

Because the spirit-language in technology proper has not previously received

theological treatment, I will begin by examining the spirit-language in three specific

fields of technology: science, ecology, and technological social criticism. Each of these

fields uses spirit-language and has, to some extent, received some attention from

pneumatology. In the fourth section of this chapter, however, I will turn to the use of

spirit-language in technology proper.

The use of spirit-language is not consistent across the technological sub-

disciplines. First, in religion-and-science discussions, spirit has recently been invoked as

an explanatory link between the strict causality of physics and the Christian doctrine of

divine action in the world.[110] Second, in ecological discussions (especially ecotheology),

spirit is depicted as indwelling creation, thus sacralizing nature and adding moral gravity

to what might otherwise be considered a purely materialistic problem of ecological

destruction.[111] Third, in social criticism, spirit is seen as an important aspect of social

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110 Stuart A. Kauffman, *Reinventing the Sacred: A New View of Science, Reason, and Religion* (New York, NY: Basic Books, 2008); Amos Yong, ed., *The Spirit Renews the Face of the Earth: Pentecostal Forays in Science and Theology of Creation* (Eugene, OR: Pickwick Publications, 2009); Philip J. Hefner, *Religion-and-Science as Spiritual Quest for Meaning: Proceedings of the Sixth Annual Goshen Conference on Religion and Science*, ed. Carl S. Helrich, Goshen Conference on Religion and Science 6 (Kitchener, ON: Pandora Press, 2008); Joan D. Koss-Chioino and Philip J. Hefner, eds., *Spiritual Transformation and Healing: Anthropological, Theological, Neuroscientific, and Clinical Perspectives* (Lanham, MD: AltaMira Press, 2006); John C. Polkinghorne, 'The Hidden Spirit and the Cosmos', in *The Work of the Spirit: Pneumatology and Pentecostalism*, ed. Michael Welker (Grand Rapids, MI: Eerdmans, 2006), 169–82; John C. Polkinghorne, 'The Continuing Interaction of Science and Religion', *Zygon* 40, no. 1 (2005): 43–49; Jürgen Moltmann, *Science and Wisdom* (London: SCM Press, 2003); Peter Vardy, *Being Human: Fulfilling Genetic and Spiritual Potential* (London: Darton Longman & Todd, 2003); Ronald Cole-Turner, 'Science, Technology, and the Mission of Theology in a New Century', in *God and Globalization: The Spirit and the Modern Authorities*, ed. Max L. Stackhouse, Peter J. Paris, and Don S. Browning, vol. 2, 4 vols., Theology for the Twenty-First Century (Harrisburg, PA: Trinity Press International, 2001), 139–65; Arthur Peacocke, *Theology for a Scientific Age: Being and Becoming - Natural, Divine, and Human* (Minneapolis, MN: Fortress Press, 1993); Jürgen Moltmann, *God in Creation: An Ecological Doctrine of Creation*, Gifford Lectures 1984-1985 (London: SCM Press, 1985).

111 Wallace, *Fragments of the Spirit*; Kathryn Tanner, ed., *Spirit in the Cities: Searching for Soul in the Urban Landscape* (Minneapolis, MN: Fortress Press, 2004); Andrew K. Gabriel, 'Pneumatological Perspectives for a Theology of Nature: The Holy Spirit in Relation to Ecology and Technology', *Journal of Pentecostal Theology* 15, no. 2 (1 April 2007): 195–212; Steven M. Studebaker, 'The Spirit in Creation: A Unified Theology of Grace and Creation Care', *Zygon* 43, no. 4 (December 2008): 943–

reality that goes beyond the purely material. Finally, in technology proper, the

relationship of spirit to matter is understood to have implications for the use and

development of technique.[112] This attention to the use of spirit-language in technology

will enable us, in the next chapter, to analyze the pictures of spirit that are assumed by

technology. In other words, we will finally be able to sketch out the implicit

pneumatology within technology.

Spirit in Religion-and-Science

Though the exact nature of the link between science and technique is itself a cause

for debate, it is clear that science and technique are related in some way. Is technique

simply "applied science"? Often techniques have been developed without a scientific

understanding of how they work, while modern science would be impossible if it were

not for the technical apparatuses used in experiments and for measurement. So then, does

science produce technique, or does technique produce science? These questions reveal

the complexity of the relationship between science and technique. Yet, despite the

ambiguity of the precise nature of the relationship, it is clear that science and technique

are related. As a result, the recent introduction of spirit into questions of religion-and-

science undoubtedly has implications for technology.

The introduction of spirit into science is, in many ways, an unexpected

development. The materialistic presuppositions of science make it very difficult to speak

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60; see also Michael Northcott, 'BP, the Blowout and the Bible Belt: Why Conservative Christianity Does Not Conserve Creation', *The Expository Times* 122, no. 3 (2010): 117–26.

112 David F. Noble, *The Religion of Technology: The Divinity of Man and the Spirit of Invention* (New York, NY: Alfred A. Knopf, 1997), 4; Richard G. Wilkinson and Kate Pickett, *The Spirit Level: Why More Equal Societies Almost Always Do Better* (London: Allen Lane, 2009).

of God at work in the world: the scientific method requires a determinative cause-and-effect world in order to make sense, while empiricism devalues the intangible. Yet recent developments in mathematical and theoretical physics seem to open a door for a plausible supernatural being whose existence is nevertheless consistent with modern Western science. For scientists who want to maintain a theistic worldview, these developments offer an attractive possibility for harmonizing science and religion.

The key feature of these developments is summarized by John Polkinghorne as intrinsic uncertainty or unpredictability.[113] Within the paradigm of Newtonian physics, the world operated according to laws which were, in principle if not in detail, knowable. Where uncertainty in calculations existed, it was caused by an inability to measure precisely. In principle, though, everything could be predicted if one were only to know the exact location of every particle in the universe and its direction and speed of movement. The shift in science to quantum physics involved a corresponding shift toward epistemological openness. The discovery of quantum uncertainty described in mathematical language a level of reality in which only the speed *or* the location of a subatomic particle could be known. As such, it was seen to be *logically impossible* to know all of the details required in order to accurately predict the operation of the universe. Reality became, in theory as well as in practice, unpredictable.

The shift to quantum physics caused the scientific community to pay attention to the unpredictability encountered in other domains. Quantum unpredictability applied at the level of subatomic particles, but then Henri Poincare's uncertainty principle made a similar claim at the level of atoms and larger objects, popularized as "the butterfly

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113 Polkinghorne, 'The Hidden Spirit and the Cosmos', 174–175, 177–179.

effect." The number of factors influencing any given object is so immense that accurate prediction is practically impossible. The smallest event, such as the movement of air caused by a butterfly's wings, could potentially "cause" a hurricane. Similar conclusions came out of systems theory: systems which began in a chaotic state were found to organize themselves into patterns that could not be explained by the rules governing the system. In biology too, the effects of higher levels of complexity on lower levels have challenged the dominance of classical empirical reductionism, which saw the causal chain moving from bottom to top rather than from top to bottom.

All of this has lead Polkinghorne, among others, to suggest that reality may be comprised of more than just energy. The revolution in physics caused by Einstein's discovery of the speed of light as $E=mc^2$ demonstrated the interchangeability of matter and energy. Previously, all reality was thought to consist of just two "substances" – matter and energy; Einstein's formula reduced known reality to just one "substance" in two forms. Yet the discoveries noted above complicate this picture. As a result, some scientists are now suggesting that *information* may represent a second "substance" of reality which is just as intrinsic and foundational for understanding the operation of the universe as energy. The importance of information may represent a quantum leap at yet another level.

If one is looking for a scientific explanation for the Christian idea of the Spirit of God, then it seems that intrinsic uncertainty is a likely location. Intrinsic uncertainty grants to the universe a level of contingency which allows for the existence of a supernatural being. An even bolder approach claims that the Spirit of God can be

conceived of as "active information."[114] Assuming that information is a causal factor parallel to energy, this becomes an attractive way to account for the activity of God in a materialistic universe. What makes both of these proposals work is the scientific hypothesis that reality requires explanations beyond those which science, even in principle, can provide. Hence, there is nothing to stop one from attributing those explanations to God. Of course, intrinsic uncertainty and causal information can never "prove" the existence of God; it can merely make belief in God not incredible. There is a family resemblance between this rhetorical strategy and the now discredited "God of the gaps," and Polkinghorne intentionally uses the term, "spirit of the gaps" for similar effect. Yet he claims that the move rests on stronger philosophical foundations, since the "gaps" in question are no longer merely temporary holes in our knowledge, which may be filled in by more research, but are considered intrinsic to the nature of reality. The "spirit of the gaps" may then be the causal link between a transcendent (immaterial) God and material reality.

It is telling that scientists such as Polkinghorne seek to include the Spirit of God in this way. Though the understanding of "spirit" that is used by these scientists is muddy at best, the impulse to include spirit in science (and thereby connect spirit to technique) is compelling. Something about the language of spirit seems appropriate to describe the activity of a God who is not strictly required by science. Following these same markers, Stuart Kauffman, a biologist and an atheist, argues for a recovery of the "sacred." Acknowledging the problems with such a recovery, he admits:

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114 Ibid., 177–178.

The very notion that we might choose to reinvent the sacred may be too threatening to embrace, or may seem pointless to billions of people of faith, or equally to secular humanists: indeed, it is important to realize that for millions if not roughly a billion of those of us who do not believe in a Creator God, we the secular children of the Enlightenment often feel that the very words *sacred* and *God* are utterly corrupted.[115]

Yet Kauffman finds having a name for the creativity in the universe to be helpful and, for lack of a better term, he is willing to name it "God."

I believe we need to find a global spiritual space that we can share across our diverse civilizations, in which the sacred becomes legitimate for us all, and in which we can find a natural sense of God that we can share to a substantial extent whatever our religious convictions.[116]

It seems that "God" or "sacred" add something to our understanding of reality that pure science does not deliver. Borgmann describes this element as "grace" or "contingency."[117]

Spirit in Ecological Discourse

Ecological discourse approaches nature through science but also through the lenses of ethics, poetry, and human spirituality. Because ecological discourse and/or ecotheology are often highly pneumatological, their conceptions of spirit are often much more developed than those of science. Yet the relationship to technique is often left unexplored. How is spirit-language used in ecology, and what are the technological connections?

Killing Spirit: Anthropocentrism

Theological reflection on nature for most of the past fifty years has centred around the criticisms in Lynn White, Jr.'s article, "The Historical Roots of Our Ecological

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115 Kauffman, *Reinventing the Sacred*, 282–283.
116 Ibid., 283.
117 Borgmann, 'Contingency and Grace in An Age of Science and Technology'.

Crisis." In this seminal essay, White argued that the current ecological crisis was the

result of uniquely Christian attitudes toward nature. White blamed, in particular, the

anthropocentricism of the Genesis creation stories as one source of these attitudes.

> God had created Adam and, as an afterthought, Eve to keep man from
> being lonely. Man named all the animals, thus establishing his dominance
> over them. God planned all of this explicitly for man's benefit and rule: no
> item in the physical creation had any purpose save to serve man's
> purposes. And, although man's body is made of clay, he is not simply part
> of nature: he is made in God's image.[118]

Furthermore, these attitudes had come to dominate not only Christian culture, but all

industrial society.

> Our science and technology have grown out of Christian attitudes toward
> man's relation to nature which are almost universally held not only by
> Christians and neo-Christians but also by those who fondly regard
> themselves as post-Christians. Despite Copernicus, all the cosmos rotates
> around our little globe. Despite Darwin, we are not, in our hearts, part of
> the natural process. We are superior to nature, contemptuous of it, willing
> to use it for our slightest whim.[119]

White also implicated Christian deprecation of spirit as having an important role to play.

> To a Christian a tree can be no more than a physical fact. The whole
> concept of the sacred grove is alien to Christianity and to the ethos of the
> West. For nearly 2 millennia Christian missionaries have been chopping
> down sacred groves, which are idolatrous because they assume spirit in
> nature.[120]

White held that, in order to address the ecological crisis, we need to reimagine our

relationship to nature, either with a new religion or with a new way of understanding our

old religion. White, a professed "churchman" himself, seems to have preferred the latter

option. Famously, in the last sentence of the article, White upheld St. Francis of Assisi as

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118 White, 'The Historical Roots of Our Ecologic Crisis', 1205.
119 Ibid., 1206.
120 Ibid.

the ideal patron saint of ecologists. For White, spirit exists within nature to make it holy, and spirit-language functions to place limits on the appropriateness of human technical control.

Replacing Spirit: An Anthropology of "Stewardship"

White's challenge has been taken as a call to a new anthropology – a reinterpretation of the meaning of the *imago Dei*. This call has been answered most prominently by Barbour, who suggests three basic interpretations of humanity's relationship to nature: that of dominion, unity, or stewardship. Barbour argued that the traditional attitude had been that of dominion.[121] Yet, dominion itself has largely been disfigured and displaced by an attitude of domination, which views technique as a liberator because it allows the *imago Dei* to exercise its will upon nature, as White described.[122] On the other end of the spectrum, the attitude of unity emphasizes humanity's involvement with and in nature.[123] For that reason, the attitude of unity views technique as a threat.[124] Mediating the poles of domination and unity is the attitude of stewardship.[125]

> Attendant to stewardship is a recognition that technology is value neutral: it is neither intrinsically good (i.e., liberator) nor evil (i.e., threat), but instead a powerful instrument that can be used for either good or evil, or both. Technology is subject to, and expressive of, social power.[126]

Barbour proposed that St. Benedict, whose *Rule* ensured that the monastics remained

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121 Russell, 'Five Attitudes Toward Nature and Technology from a Christian Perspective', 151.
122 Ian G. Barbour, *Technology, Environment, and Human Values* (New York, NY: Praeger, 1980), 13–14.
123 Ibid., 18ff.
124 Russell, 'Five Attitudes Toward Nature and Technology from a Christian Perspective', 152.
125 Barbour, *Technology, Environment, and Human Values*, 24–25.
126 Russell, 'Five Attitudes Toward Nature and Technology from a Christian Perspective', 153.

involved in both worldly work (technique) and spiritual work (prayer), should be the model for our interaction with nature, rather than St. Francis. For Barbour, the Spirit of God is the Creator of Life, and other spirit-language, which refers primarily to the human spirit or *imago Dei*, functions to sanctify human technical work while simultaneously recognizing its ability to be misused for evil and calling it into the service of the good.

Saving Spirit: Soteriology

Steven Studebaker's analysis displays a family resemblance to White's when he offers the distinction between common grace/general revelation and special grace/revelation as a cause for pentecostal-evangelical disinterest in ecology.[127] The problem for evangelicals, Studebaker posits, is not so much a misguided anthropology (White's argument) as a deficient soteriology, in which creation as general revelation is inconsequential for salvation and therefore expendable. The solution, for Studebaker, is to view creation as one of the spheres of Spirit's redemptive activity.

> A pneumatological and unified theology of grace that takes the Spirit's work in creation and redemption in comprehensive terms provides a way to see creation care as a dimension of Christian formation and sanctification. Creation care is a pneumatological participation in the eschatological redemptive mission of the Triune God and, as such, it is a dimension of Christian formation.[128]

Studebaker's purpose is to advocate for creation care, so he does not offer an analysis of technique. However, he implies in his examples and anecdotes that the care of creation occurs primarily through individual (consumer) ethics, which are to be guided by spiritual formation in the church. Studebaker sees the Spirit of God as actively at work in

127 Studebaker, 'The Spirit in Creation'.
128 Ibid., 956.

salvation history, and uses spirit-language to identify areas in which humans may

participate with God in that salvation.

Using Spirit: Ecological Pragmatism

Observing these kinds of arguments, Michael Northcott cautions against the

pragmatic use of theology for ecological ends. As Northcott describes it, it has been

difficult to convince certain segments of the population a) that an environmental crisis

exists and b) to do anything about it. In some cases, when these populations are seen to

be religiously motivated, theology has been utilized as an avenue into the problem.

> [M]ost of those who engage and promote the religion-ecology dialogue do
> so from a pragmatic belief that it represents a way of involving non-
> experts in conservation, and a way of drawing religious impulses into a
> science-informed project that does not involve traditional religious
> belief.[129]

Yet this approach has not been successful precisely because it fails to understand the

inter-related nature of religious convictions.

> Pragmatic attempts to engage religion in the scientific conservation effort
> miss the ideational origins of the ecological crisis in the late medieval
> theology of mechanism and in the modern scientific worldview which it
> birthed. They also miss the deep implication of modern capitalism in this
> worldview.... Without a challenge to these seminal origins of the
> ecological crisis the conservation enterprise – whether or not it is hitched
> to religious communities – lacks cultural purchase. It remains, as Wendell
> Berry observes, a sideline; an attempt by environmentalists to separate out
> parts of nature – and of human community – from the mechanistic drive of
> industrial capitalism while leaving the beast fundamentally untamed and
> still at large.[130]

Northcott's argument suggests that conservation requires not only a reinterpretation of the

imago Dei, but a reconception of nature as something beyond human control – a gift, not

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129 Northcott, 'BP, the Blowout and the Bible Belt', 124.
130 Ibid., 124–125.

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"natural capital." For Northcott, spirit is the source of life for all creatures, and spirit-language functions to limit the appropriateness of human technical control.

Resurrecting Spirit: Ecotheology and Panentheism

George Hendry's *Theology of Nature* is notable because it characterizes the "science of nature" as one of four approaches to nature that also include the mystery of nature, the religion of nature, and the philosophy of nature. This de-privileging of the scientific approach is one of the keys to Hendry's project: the development of a theology of nature. For Hendry, a theology of nature is not a theological account of (scientific) nature; rather, a science of nature is one way to understand the theological Creation. It is this relativizing of the scientific that gives Hendry's theology its unique perspective, but it also means that, like Studebaker's, no explicit theology of technique is given. Instead, Hendry proposes a relation to nature that is explicitly incarnational and pneumatological: the Christian participates with Christ, through the Spirit of God, in the suffering of creation.[131]

Mark Wallace's *Fragments of the Spirit* represents post-modern eco-theology, and especially highlights the role that spirit plays in recent theologies of nature. Wallace takes a panentheist position when he portrays spirit as incarnated in creation, or as a life-form who inhabits and sustains all other forms of life. Consequently, Wallace urges his readers to understand ecological destruction as both "ecocide" and "deicide." Though he does not offer an explicit theology of technique, technique plays a role in the prospect of deicide, according to his portrayal, by enabling humans to consume more than their share of

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131 George Stuart Hendry, *Theology of Nature* (Philadelphia, PA: Westminster Press, 1980), 211ff.

nature (which is transformed by technique into a "resource") and disrupting our sense of identity with nature.[132]

In ecotheology and panentheism, spirit is not simply the source of nature, it dwells alongside or within nature. Spirit-language therefore functions to place limits on the appropriateness of human technical manipulation of nature.

Spirit in Social Criticism

Social criticism is another way to view the implicit pneumatology in technology. As with theologies of nature, both religious and non-religious social criticism make frequent use of the category of spirit, indicating that spirit encompasses or describes an aspect of reality which is appropriate and useful to social criticism. Yet, as with scientific discourse, spirit is often used as a generic category which includes all non-material reality.

Non-Religious Social Criticism

One of the key issues identified by recent social criticism is the expanding influence of materialism. Materialism, characterized as an overemphasis on physical objects, is seen to devalue intangibles like emotion, relationships, and attitudes. Under both Marxist and capitalist materialism, the person suffers because of a lack of things. Both Marxism and capitalism are strategies for maximizing happiness through the procurement of things. Each attempts to solve the problem of human suffering on a purely material level, and therein lies their failure.

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132 Wallace, *Fragments of the Spirit*, 135.

Richard Wilkinson and Kate Pickett seek to locate the source of happiness not in the *absolute* standard of living conditions, but in the *relative* standard of equality. In their study, *The Spirit Level*, they use measurable markers of happiness, such as longevity, health, birth rates, infant mortality, and rates of young, single mothers, to show that inequality has more of an effect on happiness and "the good life" than the absolute (material) standard of living. Moreover, the positive effects of equality benefit those in every strata of society, not just the poor.[133] The value of an increased standard of living achieved by advanced capitalist technique is thus relativized by the hierarchical stratification of a technicized society.

William Greider also forms his argument around the idea of the "soul" of capitalism, which he regards as the generation of wealth. The success of capitalism's model of wealth generation is the reason why capitalism has emerged as the dominant economic system globally and is virtually unquestionable. Indeed the apparent success of capitalism has persuaded progressives and conservatives alike to place traditionally sacred domains under the control and logic of markets. Ecological destruction must be mitigated by "cap-and-trade" market mechanisms which monetize pollution in order to make it real/relevant within an economic framework. Education and healthcare are increasingly managed not by principles of justice and equality, let alone mercy or empathy, but rather by supply and demand. Within the capitalist system, the only way to solve the problem is to "incentivize" the providers by adding more money to the system through privatization. The rights to genetic material "discovered" by corporate researchers are owned and licenced by private firms, since the financial "risk" of research

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133 Wilkinson and Pickett, *The Spirit Level*.

must be rewarded monetarily. The technical fix leads inexorably toward privatization and the surrender of control to specialists and experts. What is therefore needed is not a reform of the system of capitalism, but a renewal/rebirth of its soul through the engagement of ordinary people. By this, Greider appears to mean that solidarity, collective action, and true engagement with the Other is required in order to create a society in which individuals are enabled to achieve self-realization.[134]

In *Shop Class as Soulcraft*, Matthew Crawford addresses the separation of thinking from doing.[135] This separation leads to a "despiritedness" or loss of pride in one's work. Doing is done without thinking, and thinking is done without doing. He argues for a reintegration of thinking and doing, as performed by the tradesman (at a lower level) and exemplified by the craftsman (at a higher level). The (re)unification of thinking and doing ennobles people's spirits and gives them a sense of pride and dignity. In this sense, Crawford's argument follows in the tradition of Heidegger in calling for the recovery of the value of art (craft, trade, skill) as a way, not merely of doing, but of knowing.

What these studies and others are finding is that criticism of the deepest social issues cannot succeed on purely materialistic grounds because the social systems being critiqued are the logical product of materialism. Though these authors do not work in a theological mode, their critiques take them beyond individual, isolated instances of injustice and cause them to address the spiritual/psychic aspects of social systems – the "soul" of institutions.

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134 William Greider, *The Soul of Capitalism: Opening Paths to a Moral Economy* (New York, NY: Simon & Schuster, 2004), 330.
135 Crawford, *Shop Class as Soulcraft*.

Religion-Based Social Criticism

William Stringfellow's writing on "the Powers" takes a similar position. Stringfellow's analysis is primarily historical-theological. According to Stringfellow, the biblical term "principalities and powers" refers to realities which, in current parlance, can be identified as images, institutions, and ideologies. The Powers become demonic when they invert the natural (i.e., God-given) order of dominion and make human beings their servants rather than their masters (*cf*. Gen. 1-2). In this idolatrous inversion, the Powers ultimately serve death rather than God. When human beings worship and serve the Powers, they become servants of death.[136]

Walter Wink has continued this vein of thought with an exegesis of the biblical concept of the Powers. For Wink, the Powers are neither purely spiritual nor purely material. The Powers are "the inner aspects of material or tangible manifestations of power."[137] In a sense, the Powers exist at the nexus of material and spiritual reality. Mob spirit is not a spirit which exists "in the air" and then swoops down and inhabits a crowd of people; but it is also not the accumulated effects of people gathered together (reducible to sociological/psychological factors).[138] Rather, the Powers are created by God for good purposes, but, like all of creation, are fallen and subject to sin.

Spirit in religious social criticism represents a dimension of reality which is not reducible to matter or the accumulated effects of material causes. Spirit both creates and

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136 William Stringfellow, *A Keeper of the Word: Selected Writings of William Stringfellow*, ed. Bill Wylie-Kellerman (Grand Rapids, MI: Eerdmans, 1994); see also William Stringfellow, *The Politics of Spirituality* (Philadelphia, PA: Wipf & Stock, 2006).

137 Walter Wink, *Naming the Powers: The Language of Power in the New Testament* (Philadelphia, PA: Fortress Press, 1984), 104.

138 Ibid., 105.

is created by institutions and structures. Spirit is not identical to the Spirit of God, but is rather the matrix in which the Spirit of God operates.

In the religion-and-science discourse, a connection between spirit and technique is implied, but both of the concepts remain ambiguous. In theologies of nature, spirit takes on a more definite shape, while technique remains unclear. In social criticism, technique is addressed more specifically, but spirit becomes a murky catch-all. Very rarely is a relationship between a definite understanding of spirit and a specific picture of technique attempted.

Spirit and the *Telos* of the Natural World

Historically, a relationship between spirit and technique would have been much easier to conceptualize. According to two recent studies by Mitcham and Davis, the purpose of technique was addressed much more specifically in ancient Greek philosophy and culture.[139] Both of these studies ask the question: why did Greek technique not develop at a corresponding rate to its science? (I would suggest that a similar question could be asked with regard to the development of Chinese technique.) One answer is that, in a Greek worldview, *techne* was seen to be unworthy of development apart from specific ends derived from other concerns. While *scientia* could and ought to be sought for its own sake, a technical research institution – let alone a hackerspace or hacklab – would have seemed absurd. However, another answer is that the Greek concept of spirit

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139 Davis, *Means Without End*, 6–16; Mitcham, 'Philosophy and the History of Technology', 191–198.

functioned as a limiting influence on the development of technique. For the Greeks,

nature was both spiritual and material. The existence of spirit in the natural world gave

nature as a whole and in its parts a *telos* independent from human purposes. Therefore,

the appropriate use of *techne* involved a seeking out of the particular *telos* of the object.

Mass-production would have been impossible in this view, because each object or

product would have to be specially produced in dialogue with its own "spirit."

In a Chinese context, Zhuangzi, a Daoist philosopher, gives us the story of the

master carver:

> Khing, the master carver, made a bell stand
> Of precious wood. When it was finished,
> All who saw it were astounded. They said it must be
> The work of spirits.
> The Prince of Lu said to the master carver:
> "What is your secret?"
>
> Khing replied: "I am only a workman:
> I have no secret. There is only this:
> When I began to think about the work you commanded
> I guarded my spirit, did not expend it
> On trifles, that were not to the point.
> I fasted in order to set
> My heart at rest.
> After three days fasting,
> I had forgotten gain and success.
> After five days
> I had forgotten praise or criticism.
> After seven days
> I had forgotten my body
> With all its limbs.
>
> "By this time all thought of your Highness
> And of the court had faded away.
> All that might distract me from the work
> Had vanished.
> I was collected in the single thought
> Of the bell stand.

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"Then I went to the forest
To see the trees in their own natural state.
When the right tree appeared before my eyes,
The bell stand also appeared in it, clearly, beyond doubt.
All I had to do was put forth my hand
And begin.

"If I had not met this particular tree
There would have been
No bell stand at all.

"What happened?
My own collected thought
Encountered the hidden potential of the wood;
From this live encounter came the work
Which you ascribe to the spirits."[140]

While Zhuangzi seems to be deconstructing his contemporary Chinese concept of spirit with this parable, he nevertheless maintains a sense of *telos* in the natural world. He highlights the role of intentionality and unique purpose, which is perceived after ritual fasting and meditation. So spirit in nature implied also a *telos* for nature, and the *telos* of nature then provided a natural limit to the manipulation of nature through technique.

Spirit and the Being of Beings

Among modern reflections on technique, the most explicit connection with spirit is made in Ignacio Götz's *Technology and the Spirit*. For Götz, spirit is inextricably connected with nature. Here, spirit functions not so much to provide a *telos* for nature, but to sanctify nature and all physical things. Even technique, in this conception, is wholly "natural" (because it involves the material world) and therefore a locus of the divine. In response to criticisms of technique, Götz takes an instrumentalist view of

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140 Referenced by Mitcham in "Bibliographic Note II," from 'Philosophy and the History of Technology', 194–195. Text from Thomas Merton, *The Way of Chuang Tzu* (New York, NY: New Directions, 1965), 110–111. See *Chuang Tzu* XIX, 10.

technique, and argues that all problems caused by technique are really problems in the

human heart. "The danger of technology is neither more nor less than the danger of any

use we make of ourselves. We do not need technology to do evil."[141] It is humanity, rather

than technique, that needs to be limited. Accordingly, Götz gives considerable attention

to education and spirituality.

Götz's approach to technique and spirit is explicitly Teilhardian. For Götz, as for

Teilhard de Chardin, the concept of spirit is a pluralist synthesis from among the world's

religions and traditions.[142] However, one of the criticisms of religious pluralism is that,

because all traditions are equalized, pluralist theology belongs to no tradition. So,

although Teilhard de Chardin was ordained as a Jesuit, it is difficult to tell what, if

anything, is specifically Christian in his pneumatology. In a similar way, for Götz, "Spirit

consists in the radical openness or self-transcendence characteristic of human nature. It is

the basic possibility of a true human existence in time. It is opposed to *thing*, the Sartrean

in-itself, and to all facticity."[143] Presumably, he would argue that all truth and all religious

insight derives from God. Spirit and technique are both universal. Therefore, their

character need not be derived from only one tradition. Yet streams within the Christian

tradition do contain a specific pneumatology and cosmology. In particular, Götz does not

attempt to account for the Christian distinction between spirit or the spiritual and the

Spirit of God. Götz maintains that the "curse" of Genesis 2 refers exclusively to

humanity, and that the rest of nature should not be considered "fallen."

Götz argues for a critical use of technique. Opposition to technique is misguided

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141 Ignacio Götz, *Technology and the Spirit* (Westport, CT: Praeger, 2001), 18.
142 For the influence of Teilhard de Chardin on Götz, see the personal note, ibid., xiii–xiv.
143 Ibid., 54.

because the use of technique is what makes us human. "Technology is basically how humans care about the Being of (technical as well as natural) beings. This has been the case since the earliest human beginnings, for without technology... we humans would not have come to be."[144] Götz argues for a critical openness to technique which corresponds to a critical evaluation of our own motivations and desires. Problems associated with technique, in particular the expanding ability to dominate and destroy others, should be faced directly yet without demonizing technique itself, which produces a great amount of good as well.

For Götz, the problems caused by technique require a spiritual response. Through education, a spirit should be inculcated in children and within society of attention to our surroundings. Götz concludes with the following proposal:

> We need to learn to appreciate this earthly life of ours, this technological life, to the point where we would think it a loss not to be technological. This is the task I envision for our schools, where an effort must be made to teach children how to value their lives precisely because they are technological, and at the same time, through the spirit, how to gain a new appreciation of technology in all its manifestations.[145]

Götz's proposal is an attempt to overcome what he perceives to be a dualism between matter and spirit – to transcend good and evil through a vision of openness to the beyond which is empowering rather than constricting.[146]

Spirit: Freedom and Life

The spirit is also an important aspect of Ellul's theology. The role of spirit in Ellul's thought often goes unappreciated – perhaps because it is overshadowed by his

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144 Ibid., 33.
145 Ibid., 121.
146 Ibid., 119–120.

social critique. Yet it could be argued that all of his theology is self-consciously

pneumatological. Indeed it has been argued that spirit is key to Ellul's theology as the

realm in which truth as well as freedom exist.[147] Ellul's work on technique is merely the

negative half of his thought: clearing away human delusions of self-determination or self-

sufficiency, while the positive half is to emphasize the absolute sovereignty of God, who

participates in history through the Spirit of God.[148]

For Ellul, technique is a determinative system, "the totality of methods rationally

arrived at and having absolute efficiency (for a given stage of development) in every field

of human activity."[149] Human beings are not fated to be determined by technique, but

when they submit to technique they become determined by a system which is radically

closed and predictive. Thus submission to technique is the antithesis of human freedom.

Paradoxically, the human desire to control the environment, to self-determination and

self-importance, leads to determinism, the loss of freedom, and ultimately the loss of life.

The way out of this paradox, as Ellul sees it, is to accept ambiguity,

indeterminacy, and inefficiency. Ellul describes this solution as the life of the Spirit of

God.

> [W]hen I speak of "life" I am not thinking of some esoteric mysticism or
> vitalistic theory of hermetic philosophy. I simply mean the expression of
> the Holy Spirit, working within us, expressing himself in our actual life,
> through our words, our habits, and our decisions. ... In the powerful
> presence of the Holy Spirit... we are bewildered because we are no longer

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147 Raymond Gozzi, 'Jacques Ellul on Technique, Media, and the Spirit', *New Jersey Journal of Communication* 8, no. 1 (2000): 79–90.

148 For a discussion of the two tracks in Ellul's thought and writing, see Marva Dawn, 'Introduction', in *Sources & Trajectories: Eight Early Articles by Jacques Ellul That Set the Stage*, trans. Marva Dawn (Grand Rapids, MI: Eerdmans, 1997), 4–5. Though Ellul was a Reformed Calvinist, his discussion of human freedom *vis-à-vis* divine sovereignty is nuanced and complex. For a case study, see *The Politics of God and the Politics of Man* (Grand Rapids, MI: Eerdmans, 1972).

149 Ellul, *The Technological Society*, xxv.

very sure about the way forward, which no longer depends upon us. The end, as well as the means, has been taken away from us, and we hesitate as we look at this way which lies before us, whose end we cannot see; we have only one certainty, and that is the promise which has been made to us of a certain order, which God guarantees: "Seek ye first His Kingdom and His righteousness, and all these things shall be added unto you."[150]

For Ellul, then, the choice is between living by the "spirit of the world," which in the modern world is dominated by technique, and living by the Spirit of God. In concrete terms, it is the choice between being at the centre of one's own history by controlling events and accepting a role in a history which finds its centre in God.

CONCLUSION

Each of the fields of technology that I have explored understands spirit interacting with technique in some way. My purpose here has not been to set up any particular conception of spirit as plausible, but rather to demonstrate the range of settings in which spirit-language is used, as well as the fundamental differences between these conceptions of spirit. It should be obvious that spirit in religion-and-science discourse is not the same as spirit in social criticism. However, it is not necessary to agree with any particular perspective chosen in order to accept the basic insight that technique is in some way related to spirit. Theistic scientists may be correct that spirit is involved with science (and technique), even though theologians may question the scientific picture of spirit. Theologies of nature may be correct in their perception of spirit in nature, even if there is room to argue about the level of spiritual immanence in nature, or the implications for technique. Social critics may be correct in their connection of spirit with social systems

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150 Jacques Ellul, *The Presence of the Kingdom* (New York, NY: Seabury Press, 1967), 95.

and institutions, even though their pneumatology is often very general and undifferentiated – there is almost no concept of a "Holy Spirit" or of "evil/fallen spirits." Finally, the discernment of spirit in theological discussions of technique, as few as they may be, is strong motivation to explore in more detail the involvement of spirit-language in technology. By highlighting these uses of spirit-language, I hope to have shown that spirit is an integral part of technology.

CHAPTER 4:
DISCERNING THE SPIRITS

In the previous chapter, language about spirit was often undefined and ambiguous. Descriptions of spirit are often contradictory or incongruent, but in a way this should be expected, for the Spirit of God blows where she will. On one hand, we try not to constrain the Spirit of God within doctrinal language, and on the other hand, we need to be able to "discern the spirits." Not every spirit is the Spirit of God. Yet, for our purposes, it was enough to show that technology uses spirit-language.

In this chapter, I will move further by identifying some of the features of spirit as used in the disciplines previously discussed, and I will apply a critical analysis to this language from a theological perspective. How does the spirit-language used by technology compare against orthodox pneumatology? This theological analysis will reveal the characteristics of spirit that are most often distorted by technology, and which must be corrected in order for technology's spirit-language to become aligned with orthodox pneumatology. My goal is to highlight some of the actual differences between the uses of "spirit" in the various discourses. More than just blindly enforcing orthodoxy however, setting out the characteristics of a "spirit" appropriate to Christian pneumatology will make a positive contribution to technology itself by suggesting

alternative ways for technology itself to speak about spirit. One consequence of this intrusion into technology by theology might be that technology, after reconsidering the spirit, may be induced to reconsider technique as well. Realizing that consequence, however, is beyond the scope of this project.

The four categories that I used in the previous chapter will be continued in this chapter, with one notable modification. In the previous chapter, I explored the use of spirit-language in religion-and-science, in ecology, in social criticism, and in technology proper. However, the view of technology proper came from ancient Greek mythology, Ignacio Götz, and Jacques Ellul. In this chapter, I am not interested in comparing biblical pneumatology to the ancient Greek concept of spirit, so that discussion will not be developed. Furthermore, Ellul and Götz are so dissimilar that it makes little sense to treat them together. Therefore the pneumatology of Götz will be considered under the category of religious pluralism, while the pneumatology of Ellul will be considered with the pneumatology of social criticism, to which it bears a close resemblance.

My goal is first to draw out the features of spirits, which are often confused with each other. Secondly, I want to analyze their resemblance and dissonance to the concept of spirit found in biblical traditions. In the process, several features of biblical spirits will be highlighted for their contrast with modern conceptions of spirit. Third, I will suggest ways in which these features of spirit found in the biblical traditions may impact the larger technological discourse.

There are many features of spirit that are appropriated by technologists – more than it would be possible to adequately treat here. The creativity of the Spirit of God is

used by some to suggest that human creativity in developing techniques is fundamentally "spiritual." Likewise, the mystery and the open-endedness of the Spirit of God are used to justify developing techniques even when we are not sure how they will be used or what effect they will have. The "passability" of the Spirit of God is leveraged in support of the idea that harmful techniques do not merely damage the environment, but actually cause the suffering of God. Even the doctrine of kenosis is used – not to encourage human self-emptying and identification with those who suffer, as Paul does in Philippians 2, but to underwrite a view of historical progress that depends on technological development (without regard for those who suffer as a result). So the logic goes that the self-emptying of God and/or God's Spirit correlates to the filling up of humanity; the "death of God" corresponds to the coming-of-age of humanity.[151]

Many of these features of spirit are themselves the subject of theological dispute quite apart from their role in technology. For example, the relationship of the human spirit to the Spirit of God, is far from settled. Therefore, I have intentionally limited my exploration of technological pneumatology to features that are relevant to the discourse (e.g., to science, ecology, etc.) and are more-or-less settled theologically. In particular, I appeal to "biblical pneumatology" not in a biblical literalist mode, but as the basis for some minimum amount of common ground. Two of the main themes that emerge, which are relatively uncontroversial theologically, are the personhood and the freedom of the Spirit of God.

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151 See Jacques Ellul, 'Cain, the Theologian of 1969', *Katallagete: Be Reconciled* 2, no. 1 Winter (1968): 4–7.

As I have already shown, the justification for spirit-language in religion-and-science discussions is based on newly developed understandings of intrinsic uncertainty, emergence theory, top-down causality, and other scientific macro-theories. The key contributors to this discussion from chapter 3 are John Polkinghorne, Arthur Peacocke, and Stuart Kauffman. There my interest was primarily in describing the theoretical foundations of a scientific understanding of spirit. Here, I would like to go one step further, and inquire into the consequences of these scientific understandings of spirit.

The spirit of science is, more often than not, a spirit of the gaps. The spirit functions as a device for harmonizing science and theology, by submitting the language of God to the grammar of science. In this way, the spirit of science is a project of Scientism, rather than of Christian theology.

The Spirit of Science: Materialist Pneumatology

Modern conceptions of spirit by the natural sciences encounter difficulties from two directions: the empiricist constraint, and a totalizing impulse. Owing to the empirical method, the natural sciences can only give consideration to material reality. Still, it is not the materialist *a priori* of science that causes difficulties. It is materialism in conjunction with the totalizing impulse of Scientism that reduces all of reality into scientific categories, rather than limit empirical science to one mode of knowledge among several. When the description of spirit is controlled by modern materialistic science, spirit comes to be understood as "quasi-material," and the relationship between spirit and matter becomes too simple. As I am using it, quasi-materiality means that spirit can be

conceptualized by materialistic science – if not yet in reality, then at least in principle.

Science takes over the dual roles of apophatic and cataphatic theology. Arthur Peacocke's

"top-down causation" makes a positive statement about the relationship between spirit

and science, while Polkinghorne's "spirit-of-the-gaps" uses a negative statement defining

where empirical explanation cannot exist as the foundation for a role for spirit. So for

both, God's nature is cast in terms of what is and is-not scientifically tenable.

The quasi-materiality of spirit is pervasive throughout religion-and-science

discourse. For example, Polkinghorne states that there are two main strategies for

speaking about spirit in the world. The first is to accept physical reductionism and not to

speak about spirit at all, and the second is to subscribe to a platonic dualism that sees

spirit and physicality as separate entities. Into this binary, Polkinghorne proposes that

> one can adopt a third metaphysical strategy, based on appealing to those
> discoveries of science that have revealed the widespread presence of
> intrinsic unpredictabilities in physical process, and then seeing them as
> revealing aspects of the nature of the world that are capable of being given
> metaphysical interpretation as signs of its possessing an openness to the
> future.[152]

For Polkinghorne, a spirit that is not amenable to scientific description is no spirit at all.

Following this strategy, however, means that science is allowed to determine the

objective world of "facts" while religion is relegated to the subjective world of

"metaphysical interpretation."

The same basic approach is taken by Peacocke, who advocates "top-down

causality" as a solution to God's activity in a world which is nevertheless scientific.

> [M]ight we not properly regard the world-as-a-whole as a total system so
> that its general state can be a 'top-down' causative factor in, or constraint

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152 Polkinghorne, 'The Hidden Spirit and the Cosmos', 169.

upon, what goes on at the myriad levels that comprise it? I suggest that these new perceptions of the way in which causality actually operates in our hierarchically complex world provides a new resource for thinking about how God could interact with that world. For it points to a way in which we could think of divine action making a difference in the world, yet not in any way contrary to those regularities and laws operative within the observed universe which are explicated by the sciences applicable to the level of complexity and organization in question.[153]

Peacocke suggests that God, as the top-down causative factor, might represent a "constraint upon" the system, rather than being constrained by the "myriad levels that comprise it." In this way, Peacocke maintains that God would not be mechanistically determined by the constituent parts of reality, just as the human person is not understood to be determined simply by the constituent parts of the physical body. Yet, if spirit is identified with the top-down causative factor, then the language and logic of God has become subordinated to the language/logic of science. According to this scheme, God remains nominally transcendent of natural reality, but in fact the language of God has already been subordinated to the materialist grammar of Scientism.

The Spirit of Science: An Impersonal Spirit

One consequence of the quasi-materiality of spirit is that spirit becomes impersonal. The spirit is said to operate on the level of fields, subatomic particles, chaos, and causality itself. Can individual human beings have unique, personal experiences of this spirit? Here lies the double-edged sword of scientific discourse. Objectivity requires that phenomena be available for investigation irrespective of the investigator, but precisely this flattening and universalizing of experience seems to rule out the possibility

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153 Peacocke, *Theology for a Scientific Age*, 158.

of personal, unique experiences. How would one quantify the Comforter? By what criteria could we measure the activities of the Advocate? For a solution, Peacocke appeals to materialistic epistemology. For Peacocke, all brain activity is the result of extremely complex interactions of precisely the kinds of subatomic particles, chaos, and causality of which spirit is said to consist. Therefore, spirit does not need to mess with physical laws in order to produce the mystic's vision, grant the grieving "peace that passes all understanding," or prompt a stranger's uncanny words of wisdom. These are all experiences which take place in the mind, either our own or another's. Spirit merely "acts" by tweaking our perceptions, intuitions, and other mental states. Polkinghorne takes a similar approach to that of Peacocke when he claims that spirit possesses "context-sensitivity" or "encounter-sensitivity."[154] In these ways, people can have "personal" experiences of spirit.

The approaches of Peacocke and Polkinghorne can be credited with attempting to create room for persons to have subjective experiences of spirit, but a further question is whether spirit is a person itself. It may be the case that spirit is multifaceted enough to, like the proverbial elephant and the blind men, provide a unique experience to each person, but that does not mean that spirit itself is a person. The spirit described by Peacocke seems to be a mental field, producing mental states, while spirit described by Polkinghorne seems to be a force-field analogous to gravity or magnetism, a force which represents the active principle toward life (the so-called Anthropic Principle). How can such "fields" be understood as persons? Lying behind this question is really a question of

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154 John C. Polkinghorne and Michael Welker, *Faith in the Living God: A Dialogue* (Minneapolis, MN: Fortress Press, 2001), 71, 97. See also Polkinghorne, 'The Hidden Spirit and the Cosmos'.

freedom vs. determinacy. Does spirit have a will? Can spirit, by its own will, make itself more present, more active, or more effective in certain times and places? Or is it a universal, a constant, maintaining the appearance of variation only as a response to changing external environmental conditions?[155]

It is hard to imagine a spirit that operates on the level of physical systems, but is constrained to act "not in any way contrary to those regularities and laws operative within the observed universe," as a person. Such a spirit cannot blow where she will. The freedom, the wildness, the untameability must simply be products of our limited perception – another way of naming the mystery of spirit. Yet, if we had the appropriate science, it seems that it would be possible to "map" the activity of spirit. There is no reason to suppose that this spirit possesses an active will which directs its activities according to its desires, rather than always in a consistent way. The materialist spirit must be a lifeless force. Of course, if we choose to believe that this materialist spirit possesses characteristics of personhood, it is possible to do so. Yet this "person" essentially and in all important ways lacks agency, and, due to a totalizing empiricism, cannot "break through" to the physical or exert its will on the physical in any substantial way. So the "personhood" of spirit remains irrelevant for understanding the work of spirit.

The Spirit of Science: Totalizing Empiricism

Because the empiricism of the natural sciences is totalizing, a scientifically

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155 For example, gravity is a relatively weak force, which only feels strong when two objects of great mass are placed near each other; though gravity is always "working," it is only in such conditions that the influence of gravity becomes perceptible. As a result, gravitational force feels more or less strong in different places in the universe. If spirit were a force-field, then it would only appear to fluctuate, but would in fact be a constant.

acceptable spirit must be experienced objectively. Objectivity means that this spirit can be discerned equally well by anyone, independent of their faith perspective. As such, the portrayals of spirit by Polkinghorne and Peacocke *et al.* are empiricist because they attempt to describe the work of spirit within the bounds of physics and biology, where physics or biology have become the dominant discourse. Physics describes a world with quantum uncertainty, and spirit is permitted to inhabit that space. Biology describes a world with top-down causality, and spirit is granted the status of the "top" top. Physics describes a world in which chaotic systems self-organize without any apparent necessary cause, and spirit is assumed to be that cause. This spirit is scientifically acceptable because, while it need not be given the name "spirit," the evidence (or in this case, the lack of evidence) is there for all to examine.

When spirit is identified with scientific macro-theories such as quantum uncertainty or the anthropic principle, then, in practice, the people best able to discern spirit are physicists rather than ordinary, spiritually sensitive church-goers. Wherever science does not have an explanation, the theistic scientist can invoke the hidden and mysterious spirit. This spirit is revealed objectively in the lack of an explanation. In this way, the language of spirit is co-opted as a theological gloss for scientific Uncertainty, which now takes on metaphysical proportions. Natural scientists, regardless of religious conviction, then take on a priestly role in the new Scientism, for they are the ones who are best able to determine where the spirit is. Yet, in each of these cases, spirit is not strictly "necessary" – an atheistic or agnostic scientist need not assume such a spirit in order to make sense of the data. Rather, spirit is imported from religious discourse in

order to provide a link between theology and science.

Yet the move to describe a role for spirit in science is not only directed by science; reasons exist for making this move that draw more on theological language and rationality. The incarnation demonstrates God's love of the material world. The universe is created to run according to certain observable principles, which exist independently of science, but which science is able to discover. Science is true – not independently, but because God created the same natural world that science investigates, and gave human beings minds and the ability to make tools with which to study it. In this way, the intrinsic goodness of Creation is what justifies science, even its methodological atheism. Yet the intrinsic goodness of Creation, when absolutized in this way, functions to legitimize an autonomous science. Thereafter, the success of science as an independent explanatory narrative produces the totalizing impulse which requires that all other discourses be subordinated to itself. Therefore, even when justified by theological statements, science when autonomized becomes Scientism. Totalizing empiricism cannot *not* produce a Grand Theory of Everything.

The Spirit of Science *vis-à-vis* Biblical Pneumatology

The function of pneumatology for totalizing empiricism is to provide a convenient religious explanation for the problems of contingency and unpredictability – a literal *deus ex machina*. This pneumatology describes an essentially static God, who at most works at the extremely microscopic level within the limits of the laws of cause-and-effect. It is both reductionistic and materialistic. As Jordan Daniel Wood puts it, this approach to religion-and-science discourse

> co-opts and inverts the grammar of belief/faith itself by treating it as if it *means the same kind of thing* to believe in the laws of physics and to believe in the resurrection of Christ (even if in differing degrees). [It] largely ignore[s] what theologians themselves have said about the nature of faith, that belief in God and belief in other things are as fundamentally different as God is from creation.[156]

This approach succeeds from the perspective of totalizing empiricism, because it offers one more explanation, but it fails from the perspective of theology, because it distorts the meaning of the personhood of the Spirit of God. So Michael Welker asks, "how... can we avoid the conclusion that the Spirit is an amorphic and only so-called 'personality,' a chameleon that changes with each encounter and each context?"[157] For an answer, Welker himself appeals to biblical traditions. Yet, the biblical traditions to which Welker refers merely assume the personhood of the Spirit of God. They do not explain how spirit conceptualized materialistically can be a person, for they do not conceptualize spirit in that way. Biblical traditions cannot weigh in on the debate, because they are unaware of a debate. The biblical traditions do not submit their language to the grammar of modern science.

A better way to move beyond a quasi-material spirit, in which spirit functions merely to explain gaps in the data discovered by the natural sciences, is demonstrated by Amos Yong. In his article, "*Ruach*, the Primordial Chaos, and the Breath of Life," Yong recognizes the problem of harmonizing science and theology, but works at it from a different angle. Beginning from theology rather than science, he argues that "the

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156 Jordan Daniel Wood, 'The Predicament of Belief – Clayton / Knapp', Book Review, *The Englewood Review of Books*, 9 February 2012, http://erb.kingdomnow.org/the-predicament-of-belief-clayton-knapp-feature-review/.
157 Michael Welker, 'The Spirit in Philosophical, Theological, and Interdisciplinary Perspectives', in *The Work of the Spirit: Pneumatology and Pentecostalism*, ed. Michael Welker (Grand Rapids, MI: Eerdmans, 2006), 226.

theologians in the conversation need to find ways of speaking more theologically without undermining the discussion with the scientists."[158] Thus, he begins by describing Philip Clayton's theory of emergence and specifically Clayton's use of spirit-language. But Yong then moves beyond Clayton's theory to fill out the picture of spirit from biblical and theological sources. Yong's revision of Clayton's pneumatology is then used to suggest some revisions in scientific thinking itself. Yong suggests that a pneumatological theology of creation can be more than just fill-in-the-gaps procedure, but rather can function to provide "theological legitimacy for the plurality of disciplines in the sciences, even while it holds forth a kind of complementarity principle which anticipates the various disciplines each providing distinctive but essential perspectives on reality."[159] Yong further suggests that pneumatology can facilitate a transformed relationship between the natural sciences and the psycho-social sciences.

> [A] pneumatological theology of creation would reaccentuate the biological and especially psychological and humanistic sciences that risk being neglected in the theology-and-science conversation, which agenda is often dictated by those engaged in the natural sciences.[160]

In this way, spirit is not simply outside of physical reality, as for Polkinghorne, Peacocke, *et al*., but is actually outside of science itself. Rather, science belongs within the Spirit of God, and is called beyond itself by God's Spirit. Pneumatology then becomes the foundation for an adequate science.

Another way to move beyond the quasi-materiality of spirit is modelled by

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158 Amos Yong, 'Ruach, the Primordial Chaos, and the Breath of Life: Emergence Theory and the Creation Narratives in Pneumatological Perspective', in *The Work of the Spirit: Pneumatology and Pentecostalism*, ed. Michael Welker (Grand Rapids, MI: Eerdmans, 2006), 201.
159 Ibid., 203.
160 Ibid.

Donald York and Anna York, who suggest that Spirit/Wisdom interfaces with science, or, more specifically, with evidence, in the form of "knowledge, discernment, truth, and beneficial results."[161] In this view, the validity of science itself becomes contingent on spirit. It recognizes that what is considered scientific "knowledge" and "truth" is often incomplete or even false and it urges humility and patient waiting upon spirit as an antidote to the hubris of Scientism. In contrast to Polkinghorne and Peacocke, this approach makes religion less dependant on science to set the agenda, and indeed inverts the relationship by having Spirit/Wisdom be the one to draw the sciences along in a journey of discovery. It is also explicitly technological in its demand for beneficial results:

> While we assume that science and technology are beneficial, we may discover that the results are ambiguous, as we have with atomic energy and a host of other scientific and technological innovations. Perhaps the key to Spirit/Wisdom is that it is... actively seeking to bring forth as much fullness of its qualities as is possible in particular times and settings and also over very long periods of time in a great variety of contexts.[162]

So not all technical innovation is the result of the Spirit of God, but only that which produces beneficial results, which can sometimes only be determined over a long period of time. "Wisdom is not achieved lightly nor cheaply and... there are few who attain it. Those who want Wisdom must cultivate certain qualities; they must be humble, willing to listen, honest, just, persevering, and committed to waiting and watching at *Sophia*'s doors."[163]

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161 Donald G. York and Anna York, 'The Spirit in Evidence: Stories of How Decisions Are Made', in *The Work of the Spirit: Pneumatology and Pentecostalism*, ed. Michael Welker (Grand Rapids, MI: Eerdmans, 2006), 217.
162 Ibid., 219.
163 Ibid.

Stanley Stowers presents yet another way of conceiving of the relationship between matter and spirit, derived from ancient and biblical sources. Stowers notes that, for some ancients, moral qualities were tied to physical materials, so that the particularities of one's substance was significant. The source of the significance of matter was *pneuma*. So, for example, in Pauline thought, "Those in Christ are literally of the same stuff. All share the very same pneuma, Christ's. It would be a wrong turn, however, to in modern fashion separate substance from quality, the spiritual (in the modern sense) from the material."[164] Rather, both technical abilities and moral virtues are characteristics of *pneuma*, which can be disturbed by physical events. This is a worldview in which one's "blood" may determine one's character, even while the blood remains a physical substance. (For example, someone may have noble blood or common blood or traitor's blood, the blood of Abraham or gentile blood.) And yet there are ways to change one's nature, including ceremonial adoption by another, whose blood is then attributed to the adoptee, or the ingestion of blood from another, as in certain sacred rituals. What is notable in this pneumatology is that the line between the physical and spiritual is messy, if it exists at all.

Implications for Technology: The Conversation Between the Spirit of Science and Biblical Pneumatology

Biblical pneumatology has important implications for technology. Technique is a rational way of performing actions in a conception of reality that is empirical and materialistic. However, if reality were understood as open to non-materialistic aspects –

164 Stanley Stowers, 'Matter and Spirit, or What Is Pauline Participation in Christ?', in *The Holy Spirit: Classic and Contemporary Readings*, ed. Eugene F. Rogers (Malden, MA: Wiley-Blackwell, 2009), 97.

if, as Stowers contends that biblical traditions assumed, physical substances were endowed with spiritual qualities – then the appropriateness of technique would need to be questioned. The idea of mass production cannot co-exist with the idea of the sacred grove. As Borgmann puts it, technology, "an approach to reality that aims at transparency and control," undermines an understanding of reality that includes such concepts as contingency and grace.[165] Conversely then, the idea of a non-materialistic Spirit of God (who mediates grace in a contingent world) challenges the appropriateness of submitting all of our activity to the logic of technique.

THE SPIRIT OF RELIGIOUS PLURALISM

The spirit of science is an important conception of spirit in modern times, but it is not the only spirit. Another important conception of spirit comes out of a perspective that can be called "religious pluralism." Here I refer to the use of spirit-language in technology proper, as found in *Technology and the Spirit*, by Ignacio Götz, which I explored in chapter 3. Götz writes in a Teilhardian mode, which can be described as Christian religious pluralism. So in this section, I want to examine some of the characteristics of the spirit of religious pluralism.

The spirit of religious pluralism is an indistinct spirit. It is an amalgam of concepts from among the world's religions. Spirit in this discourse is meant to describe an openness to the transcendent and to the other, but it is also a way of speaking about the common essence in all things. Spirit blurs boundaries – the boundary between *this* and *that*, between *us* and *them*, between *me* and *you*. It is a transgressive spirit, dissolving the

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165 Borgmann, 'Contingency and Grace in An Age of Science and Technology', 6.

boundaries that maintain isolation and independence. In this sense, spirit is communal. But it is also the spirit of nature, of matter, and of God. To be spiritual is to live a certain kind of life rather than to undergo a fundamental ontological shift (e.g., "to be saved," or "born of spirit") or to be in a particular relationship (e.g., with God).

The pluralist spirit is experienced both subjectively and universally. Unlike the spirit of science, where the experience of spirit must be objectively verifiable through the application of a rigid methodology, the spirit of pluralism is experience through a subjective perception. However, like the spirit of science, the spirit of pluralism is conceived of as universal. The experience of spirit is available to all who seek it, regardless of religious conviction. Indeed, by definition the pluralist is constrained to view all claims to spiritual experience as more or less equivalent, with little regard to the content of that experience or the ethical imperatives that follow from that experience. As a result, the concept of spirit that emerges is indistinct and general, so that it is unclear what this spirit actually does.

The Spirit of Religious Pluralism: Materialist Pneumatology

The pluralist spirit is not a "thing" or a "principle" as it is in scientific discourse. Rather, this spirit is a property of things. Spirit is "inside" of matter itself. In this way, it is similar to the spirit of biblical traditions described by Stowers above, but not identical. For Götz and Teilhard de Chardin, spirit is not the "quality" of physical substances so much as the "inner being" (or essence) of material reality. For this understanding of spirit, there does not seem to be any difference between the human spirit and the spirit of nature, let alone between the spirit of one human being and of the next. Spirit exists

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fundamentally in all things, or, in other words, is the fundamental existence of all things. So when it is said that someone "has spirit," the pluralist would be constrained not to see this as a statement about a particular person's unique status with regard to spirit. Non-human beings can also exhibit a certain spirit: art may be spirited, a certain tree or mountain may have spirit, or, as Götz argues, a computer may even be spiritual. In these cases, spirit does not seem to refer to the relative presence of spirit in an object, but rather to the subjective *ability of the speaker to discern* the basic essence – the commonality – in the object. Though spirit may be more or less easy to discern in some people or objects, spirit itself is universally present in all things – it is objectively there.

Because spirit is universal, "having spirit" or being spiritual does not mean having a spirit as opposed to not having a spirit, but rather means being conscious of spirit. This consciousness manifests itself in several ways, for example: as increased awareness of relationship or *community*, based on a sense of commonality with all things, since all things are spirit; as *courage*, based on the subordination of the self to the collective; or as *serenity*, drawn from an awareness of one's continuity with all reality. There could be, of course, many more examples. When the pluralist refers colloquially to a person "having spirit," it means, depending on the context, that they have a certain quality of life: e.g., courage, openness or vulnerability, integrity, etc. So Götz can say that "Spirit consists in the radical openness or self-transcendence characteristic of human nature. It is the basic possibility of a true human existence in time. It is opposed to *thing*, the Sartrean in-itself, and to all facticity."[166] Spirit in this sense is understood as a moral attribute.

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166 Ibid., 54.

The Spirit of Religious Pluralism: An Impersonal Spirit

While the pluralist concept of spirit should be credited with valuing the person, the pluralist spirit itself is not a person any more than the wind is. An individual may have a personal experience of the wind, and may experience through the wind a sense of connection with all other individuals who also experience the wind, but the wind itself is neither a person nor personal. Similarly, spirit as "radical openness" or "self-transcendence characteristic of human nature" is not a person, even though it might be said that it is fundamental to personhood. The spirit cannot move independently, cannot exert a will. It is no more personal than the spirit of science.

The Spirit of Religious Pluralism: The Unifier

Because spirit is the "inside" of all material reality, it is what connects all material reality. Spirit seems to be a way of saying that we are all made up of the same "stuff," despite our apparent physical differences. This spirit does not need to exist "objectively;" it does not need to be "discovered." It is enough for spirit to be assumed by religious pluralism because it justifies the humanist project. In this way, it functions like the spirit of science to fill a conceptual gap, which allows the pluralist project to work. "Spirit" becomes a reification for "the intrinsic unity of all things," which is crucial to the pluralist project.

In this way, modern epistemological pluralism, especially the kind that says that all religious traditions are merely different approaches to "one" truth, is actually closer to the monism of pre-Socratic Greek philosophy, which held that all substances are really made up of one substance, and against which pluralism was originally cast. In the case of

the pneumatology of Götz, this pluralism becomes even closer to pre-Socratic monism in that all physical reality, which it is granted is genuinely different, is at the core of its Being the same thing: spirit. So pluralism means that genuine difference dissolves back into undifferentiated unity.

The Spirit of Religious Pluralism: An Uncritical Spirit

Because a major goal of religious pluralism is to promote harmonious social relations by appealing to our essential unity rather than highlighting differences, the spirit of religious pluralism reduces our capacity to engage in critical evaluation. Difference, for the pluralist, is merely superficial, and focusing on differences is dangerous for social harmony. Why, then, should we exert ourselves in analysis of differences? And if we do go so far as to describe such differences, spirit provides us with no resources for preferring one particularity over another – for regarding one thing as "better" than another. The spirit offers no way to make judgements.

The universality of the pluralist spirit produces a non-judgemental openness to reality. Since all reality is spiritual, there is nothing that is intrinsically bad. Human ambition itself is an outworking of spirit, and is not to be checked or inhibited. If there is such a thing as an "evil spirit" for this pneumatology, it would seem to be only an attitude that is closed-off to spirit, or a blocking of human progress toward unity.

The Spirit of Religious Pluralism *vis-à-vis* Biblical Pneumatology

The concept of spirit that is invoked by biblical traditions differs from the pluralist spirit in that it is not the only spirit that exists. While in some instances the biblical

traditions conceive of God as omniscient and omnipresent, the Spirit of God is still "sent" and "departs" from places. The Spirit of God is also distinguished from the spirit of this world and from "evil" spirits. In short, just as Jesus was one human among many, spirit seems to be a kind of thing, of which the Spirit of God is one instance.

One consequence of a biblical conception of spirit is that it allows, and indeed encourages, critical evaluation. While the pluralist spirit seems to discourage criticism in favour of a flat sameness, the unity that is evoked by a biblical concept of spirit is complex. It is a unity on the far side of diversity, achieved as a result of difficult struggles and conflicts, rather than by avoiding them. There is good reason for the pluralist-humanist to avoid such a concept of spirit. At times throughout history, the need to struggle for unity has been taken as an imperative to annihilate the other – to create unity by destroying diversity. However, this is not the kind of unity that the Spirit of God creates on the far side of conflict, but simply another way to avoid conflict – by removing difference, rather than working through it.

Implications for Technology: The Conversation Between the Spirit of Religious Pluralism and Biblical Pneumatology

A biblical concept of spirit has implications for technology. If the Spirit of God is conceived of as one spirit among many, some of which are "anti-God," then it is not enough simply to note the spiritual nature of technique. The theologian must evaluate the ways in which the spirit of technique is aligned with the Spirit of God and the ways in which it is not. In particular, one would be directed to look at the essence of technique as the human impulse to control the environment *vis-à-vis* the divine mandate to "be

humble" and to "submit" to others rather than control them, a mandate which finds its ultimate model in the willingness of God to submit to death at the hands of humanity.

THE SPIRIT OF ECOLOGY

The spirit of science and of religious pluralism are two major conceptions of spirit in modern times. The spirit of ecology is less widely known, but is still important, given the modern evironmental crisis. In the previous chapter, I explored the use of spirit-language in ecological discourse. Some of the writers were Lynn White Jr., Steven Studebaker, George Hendry, and Michael Northcott. However, the most explicit pneumatology in an ecological mode came from Mark Wallace. Wallace's pneumatology is similar to other ecological pneumatologies (e.g., those of Kathryn Tanner, Sallie McFague, and Jürgen Moltmann) in its appeal to panentheism. In this section, I examine some of the implicit characteristics of the (panentheist) spirit of ecology.

The spirit of ecology is in many respects similar to the spirit of religious pluralism, as the inner essence of all reality, except that the ecological implications of universal connectedness are highlighted. This difference in emphasis is significant, however. Whereas for Götz the computer and other technical devices should be considered the spiritual equals of any tree or mountain, for eco-pneumatology (for example, some ways of articulating panentheism) the natural is privileged, and violations of the natural are seen as violence against spirit. Where for the pluralist strip-mining, pollution of rivers, and destruction of ozone might be considered regrettable acts of "closed-off-ness" to spirit, for the ecologist these are seen as ecocide, even deicide.

The ecological emphasis reveals an important weakness of the pluralist

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conception of spirit. In all likelihood, the pluralist would support an environmentally conscious ethic, but would be unable to consistently explain why one should prefer trees to bulldozers. So an eco-pneumatology is able to say more with respect to technical devices, since the devices of modern society cannot be produced without *some* natural destruction, which ecological pneumatologies would describe as ecocide or deicide. Pluralist and ecological pneumatologies are further differentiated when human violence against other humans is considered. Though acts of war definitely involve a deficient sense of the commonality of all people (as a pluralist pneumatology emphasizes), to place a lack of (awareness of) spirit at the heart of the matter seems too placid and offers few solutions, with little motivation to discover such solutions. According to the logic of pluralism *a la* Teilhard de Chardin and Götz, human life is not more spiritual (read: valuable) than the humus, nor even than fighter-jets, except perhaps in the ability of humans to reflect on their own spirituality.[167] Ecological pneumatologies have an advantage at this point, for they possess a rationale for differentiating between the natural and the artificial.

The Spirit of Ecology: Universal Experience of Nature

The experience of the ecological spirit is a subjective experience that is universally available but not verifiable. As with the pluralist spirit, there is no "proof" that an objective spirit exists within living things, and the experience of such a spirit cannot consistently be made available apart from a personal disposition. There is no methodology; rather, the experience of such a spirit derives from a subjective sense of

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167 See Götz's personal note about standing in awe before the machine in Götz, *Technology and the Spirit*, xiv; and his comment about finding 'meaning in metal,' ibid., 67.

that spirit – a willingness to perceive spirit. Nevertheless, that spirit is also a universally

available spirit. *Anyone* who desires to perceive spirit in nature will be able to have that

experience, regardless of their religious convictions or their conceptions of spirit itself.

The Spirit of Ecology: Immanence or Transcendence?

The spirit of ecology is a spirit that inhabits nature. Often through a panentheist

pneumatology, but sometimes as pantheist, spirit is at the interior of nature – a divine

spark. The presence of spirit is what makes nature sacred. According to a pantheist

theology, nature itself is God; while according to a panentheist theology, nature is in God,

but God remains outside of nature. What is common to both is that the spirit of nature *is*

the Spirit of God. The main difference is whether there remains any part of the Spirit of

God beyond the spirit of nature.

This is an important difference. If spirit is conceived of as entirely concerned with

nature, what happens to spiritual activity that is not directly connected to nature? Is work

for social justice or personal self-improvement "spiritual"? If so, then a rationale needs to

be presented, in which the spirituality of these activities derives from the spirit of nature.

For example, work for social justice might be conceived as "spiritual" because it

promotes the well-being of that part of nature which is humanity. Or personal self-

improvement might be conceived as "spiritual" because it involves an awakening to one's

responsibility to care for nature. So all spirituality must derive from ecology. Yet,

however such rationale are worked out, this framing will inevitably place limits on what

should be considered "spiritual."

A second issue arises, which is similar to one faced by pluralism. Is the Spirit of

God/nature the only spirit that exists? If the Spirit of God/nature is the only spirit that exists, then reality is divided into a simple dichotomy of spiritual and not-spiritual. Such a cosmology would need to explain how "not-spirit" can oppose the spirit of nature to the extent of ecocide/deicide. How is it that "not-spirit" can destroy nature, if nature has spirit on its side? On the other hand, if there are other spirits that exist, then theological work needs to be done relating the Spirit of God/nature to these other spirits. Are there two spirits, one good, one evil, permanently at war with each other? Or are there many spirits which exist on a continuum of sympathy-antipathy toward the Spirit of God? From questions such as these, we can see that the relationship of the Spirit of God to the existence or nonexistence of competing spirits drives the narrative of our broadest cosmologies.

The materiality of this spirit goes a long way toward solving the problems of ecological destruction, but does it do so at the cost of transcendence? The immanence of God is important because it enables God to participate in the world. A radical transcendence with no immanence situates God outside of the world, maintaining divine holiness and critical distance, but with no ability to influence the world. Yet a too-immanent God participates in the world with no critical distance; God participates, but to what end? God suffers alongside (or within) creation, but does God have a solution to the problem of suffering?

The Spirit of Ecology: Personal or Impersonal?

Ecological pneumatologies are somewhat ambivalent about the personality of spirit. Moltmann is paradigmatic on this point: he insists that spirit is a person and

criticizes Barth on just this point. The perichoretic unity of the Trinity is a communal unity among persons; spirit is not simply an energy that emanates from either the Father or the Son. Yet his terms for spirit are highly impersonal – spirit as the "principle of creativity," as "holistic principle," as unifying presence. These descriptors bear a striking resemblance to the spirit of religious pluralism.

If spirit is personal – has a will, is an agent – then the ecological spirit's personality seems to be expressed through macro-historical movements. The personhood of spirit, if it is to be more than just a dogmatic statement, is so all-encompassing that it can only be discerned in the broad arc of time. According to this view, the trend toward creativity, redemption, unity, etc., should be interpreted as more than just natural processes, but as the particular direction of history which derives from the particular personality of spirit. History is open to creativity not because creativity is "natural" but because spirit is creative, and spirit is personally involved in making history creative. This spirit bears some resemblance to the spirit of science. In the same way that the spirit of science is revealed in the "anthropic principle" (the bias of the universe toward life, or even toward human-like life), the specifics of the personality of spirit are revealed or experienced on the macro-historical, even cosmic, level. This conception of the personality of spirit, however, makes it difficult to see how an individual may have a personal experience of spirit except by meditatively getting "in-touch" with the universal essence (as with the pluralist spirit). So, spirit possesses "personhood" but is experienced impersonally.

The Spirit of Ecology: A Critical and Hospitable Spirit

As we have seen above, the ecological spirit is different from the spirit of religious pluralism because it makes critical differentiations. Because the ecological spirit is rooted in the particularity of the concept "nature," it offers us criteria by which to judge, first and foremost, the natural *vis-à-vis* the unnatural. Yet, because its particularity is sufficiently broad, the ecological spirit is not *too* judgemental. Nature transgresses the boundaries created by human institutions, and cannot be co-opted by any particular group. Therefore, the judgements of the ecological spirit are not so specific that they support factional us-*vs*-them spirituality. The spirit of nature has boundaries and so is capable of discernment and criticism, but it is also hospitable to a great variety of religious expressions.

The Spirit of Ecology *vis-à-vis* Biblical Pneumatology

Eco-pneumatology should be credited with reminding theologians that the spirit of biblical traditions has significant connections to the natural world. Yet, it would be difficult to argue that biblical pneumatology makes a one-to-one correlation of the Spirit of God with the spirit of nature. Such a move would seem to amputate spirit on the Procrustean bed of ecology. Rather, nature is one force among many which are under the control of God. The connection of spirit to nature can be seen in the foundation myths of Genesis and the wisdom literature, especially Job. Yet, those same traditions depict the separation of God from nature. Indeed, according to some interpretations of the Genesis stories, God's involvement in nature is mediated through human beings, who are installed as God's vice-regents in the Garden. The spirit (or breath) of God dwells in humanity

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rather than nature-as-a-whole. Consequently, the tragedy of the destruction and misuse of nature is intensified by the fact that it is performed by God's image-bearers, empowered as they are by the breath of God.

Implications for Technology: The Conversation Between the Spirit of Ecology and Biblical Pneumatology

If the Spirit of God in biblical pneumatology relates to nature primarily or exclusively through humanity as God's image-bearers, then human tool-building is an activity that is empowered by God. Tool-building and using is clearly not prohibited by the Spirit of God. And yet, not all human activity is sanctioned by God, and the use of tools is no different. For, in biblical pneumatology, there are many spirits which influence human beings, and not all spirits are "of God." Humans can use tools according to spirits other than God's, e.g., in the spirit of domination. It is not the tools, then, but their spirit that is called into question by the Spirit of God. The spirit of technique is revealed by our language about technique – our technology. In this situation, we must be willing to subordinate our technology to the grammar of the Spirit of God.

The Spirit of Social Criticism

So far, I have examined the spririt of science, of religious pluralism, and of ecology. Here I turn to my final spirit, the spirit of social criticism. In the previous chapter, I explored the use of spirit-language by non-religious and religion-based social criticism. The key works in the non-religious mode are *The Spirit Level* by Wilkinson and Pickett, *The Soul of Capitalism* by Greider, and *Shop Class as Soulcraft* by Crawford. The key works in the religious mode are the writings on "the Powers" by Wink and

Stringfellow as well as the implicit pneumatology of Ellul. In this section, I draw out some of the implications that belong to spirit-language in social criticism, especially in its religious mode.

When ethicists, social critics, or political philosophers refer to "spirit," they seem to be referring to the characteristics, moral qualities, or attitudes belonging to physical or social systems. The spirit or soul of an institution represents its general disposition, its typical modus operandi, its driving force: those values that determine whether any particular course of action is "characteristic" of the institution or not. These values do not necessarily determine the behaviour of an institution in every instance, but they heavily weight the likelihood of a specific behaviour.

The Spirit of Social Criticism: Subjective and Objective Experience

The identification of a spirit in social systems theory is always somewhat subjective, as is the experience of that spirit. For example, the characterization of a spirit as evil or benevolent often depends on the speaker's social location. The victim of exploitative labour practices is more likely to consider the spirit of capitalism to be evil than a corporate executive; while a supreme court justice will likely have a different perspective on the spirit of the law than someone who has been unfairly criminalized.

However, the spirit of social criticism also contains an objective pole. Spirit belongs to observable human institutions (e.g., government, family, education, the city, etc.) or material realities (e.g., nature, the earth, the cosmos). As a result, subjectivity is not complete. For any particular spirit, there is a range of descriptions which is credible, and a limit beyond which those descriptions fail to find purchase. Descriptions of the

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spirit of higher education are not likely to have very much in common with descriptions of the spirit of Wall Street, and if the two are conflated they will both be misunderstood. Spirits often have overlapping domains: their boundaries are not well-defined. But each spirit has a distinct core or centre, which it shares with no other.

The subjective and objective experience of spirit as implied by social theory is significant. It avoids the irrelevance of a purely objective spirit, as understood by science, which seems to exist merely as a theological gloss on scientifically determined facts. It also avoids the ambiguity of a pluralist spirit that contains all spirits and is available to everyone but, like the spirit of science, does nothing in particular. It incorporates the positive insights from an ecological spirit that is immanent within nature, but it resists the temptation to conflate all spirits into one spirit.

The Spirit of Social Criticism: Personhood

The spirit of social systems can be conceived of as having personhood. The spirit of an institution refers to its character or propensity, but cannot deterministically predict the behaviour of that institution. This fits with what we know about persons: they behave in ways that are generally consistent, but are not simple or deterministically predictable like a scientific law. Persons are complex. For a spirit to be a person – to have a will and to exercise it in meaningful ways – means that it will have a general character while remaining free to use a variety of means to achieve its purposes.

While a social systems theory can create room to conceptualize spirit as a person, especially from a religious perspective such as that of Stringfellow[168] and Wink,[169] social

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168 Stringfellow, *The Politics of Spirituality.*
169 Walter Wink, *Unmasking the Powers: The Invisible Forces That Determine Human Existence*

critics and others who use a social systems analysis are generally inconsistent in their use of spirit-language with regard to personhood. As I discussed in chapter 3, spirit-language in non-religious discourse is most often used anthropomorphically to stand in for abstract forces which are simply not understood. Spiritual personhood is used figuratively in order to get a handle on the social systems, but the implications of personhood do not shape the discussion of spirit's interaction with these systems. The personhood of spirit is consistent with the social systems theory, but often it is not used reciprocally to inform that theory. As a result, the analysis remains incomplete. One consequence of the failure to allow the personhood of spirit to inform social theory is that responses to the spirit of social systems tend to be overly optimistic, mechanistic, and ineffective.

The Spirit of Social Criticism: (Im)Materiality

The spirit of social systems is both material and immaterial. The existence of the invisible spirit is bound up in the existence of the visible institution in a symbiotic relationship, such that it is difficult to say which has priority. Does the spirit of capitalism call forth the institution of capitalism, or does the spirit emerge only after the advent of the institution? To some extent spirit has priority, since spirit shapes the concrete forms of the institution. Among the various avenues that exist for any given institution, spirit limits the viability of those avenues, so that some attitudes or practices simply "do not fit" with the spirit of capitalism and will not be chosen. Yet the concrete forms also shape the spirit of an institution. Putting horizontal organizational structures in place will tend to shape

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(Philadelphia, PA: Fortress Press, 1986); Walter Wink, *When the Powers Fall: Reconciliation in the Healing of Nations* (Minneapolis, MN: Fortress Press, 1998); Walter Wink, *The Powers That Be: Theology for a New Millennium* (New York, NY: Doubleday, 1999).

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the spirit of an institution in a more egalitarian direction, while hierarchical

organizational structures produce a more stratified spirit. So, in a paradox fitting for

spirit, it seems that the institution and its spirit mutually produce each other.

Spirit's involvement with matter is such that spirit requires visible manifestation,

but is not found within the material elements. Its connection to matter is analogous to the

philosophical problem of personal identity. A person continues to exist, even if they lose

some of their physical attributes, such as a limb or hair. Yet, there are tipping points:

eventually, the loss of these attributes significantly alters the character of the person, and

in extreme cases the person could be said to have been displaced by another or to have

ceased to exist altogether.

The Spirit of Social Criticism: Unity and Diversity

A social systems analysis suggests a plurality of spirits. Difference among social

institutions is indisputable. While a pluralist pneumatology tends to reduce these

differences to mere superficialities, which can be overcome by a greater attention to more

fundamental unity, a social systems analysis accepts these differences as real and

significant. The differences belong to different spirits. Because of this, judgement,

discernment, and social criticism are meaningful pursuits.

Though the differences are real and significant, they are not absolute. The

differences among spirits can be overcome by a meaningful harmony or collaboration of

spirits, or by a subordination of many spirits to one spirit, e.g., to the Spirit of God, the

spirit of Love, etc. The kind of unity that is achieved in this way is different from the

unity of pneumatological monism because it arises out of history and is the product of

choice and action, rather than of fate or Being.

The Spirit of Social Criticism *vis-à-vis* Biblical Pneumatology

Stringfellow and Wink generally use the term "Powers" when discussing social systems. Semantically, the Powers and spirit are not identical, though they are conceptually similar, and are linked textually in Ephesians 6. Spirit in biblical traditions is depicted as the life force or genius of individuals. So, for example, individuals have their own spirit, but God can also send an evil spirit upon them. One can be overcome by a spirit of jealousy or a spirit of stupor. One's spirit can be oppressed or revived. Spirit can even be passed from one person to another.

What I am calling the spirit of social systems is more closely described by the biblical concept of the Powers, especially as found in the New Testament. Biblical pneumatology places a greater emphasis on the spirit of individual beings than on the Powers, which appear primarily in apocalyptic passages. Generally, the Powers are more potent than one's spirit. One explanation for the connection between Powers and spirit might be that the Powers are made up of the same thing (*homoousia*) as an individual's spirit, but are more powerful because they belong to larger institutions. Another might be that Powers are produced by the combination of the spirits of the individuals who make up the social institution. Whatever the reason (which deserves an entirely different study), it seems that both spirits and Powers are spiritual in the biblical tradition, though Biblical traditions generally prefer to speak about the spirit with reference to individual beings.

The explanatory power of the spirit of social systems is impressive, but it can lead to a fatalistic-apocalyptic posture toward spiritual forces. The plurality of spirits creates

room for analysis and critique leading to meaningful social action, but the other-worldliness and the scale of the Powers makes it difficult to see how individuals can have any effect on them whatsoever. Biblical traditions complexify this discussion by emphasizing the spirit of individual beings. In biblical traditions, the concept of the Powers is attributed to social institutions, made up of groups of people, but the accent remains on individual, personal spirits. Even the Spirit of God is the spirit of a person.

Implications for Technology: The Conversation Between the Spirit of Social Criticism and Biblical Pneumatology

The accent on the individual-personal spirit in biblical traditions challenges the use of spirit-language in social criticism's technology. A social systems analysis would locate technique among the Powers, without necessarily articulating a personal response to technique or explaining how such a response can be effective. But a pneumatology such as that of the biblical traditions, which places the individual spirit in necessary relationship to the Powers, offers a way forward for human interaction with technique. So a social systems analysis tends to reduce human options to the three that Barbour discusses, which I paraphrase as: 1) "rage against the machine;" 2) fatalistic acceptance or willing embrace of technique; and 3) giving oneself to political structures or other Powers in order to limit or influence technique.[170] But spirit as described in biblical traditions offers further options: 4) to use one's personal-individual spirit to influence the Power of technique; and 5) to appeal to the Spirit of God to limit the Power of technique.

By focusing on the spiritual essence of technique, rather than its material

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170 Barbour's categories are actually 'technology as threat,' *Ethics in an Age of Technology,* 2:10–15; 'technology as liberator,' ibid., 2:4–10; and 'technology as instrument of power.' ibid., 2:15–23. See also Russell, 'Five Attitudes Toward Nature and Technology from a Christian Perspective'.

manifestations, the options available for human interaction with technique are shifted into a different key. A connection emerges between personal piety, which is the focus of traditional religious practices, and resistance to technological determinism, which is the concern of social critics and activists. Often the temptation is to divorce popular piety from social acts of resistance and construction. Conversely, social actors such as activists, critics, and politicians, are often exempt from criticism regarding their personal spirituality. So, the activist's success is determined by the depth of their analysis or by the success of their actions, rather than by their spirit, and the devout piety of ordinary folk is not expected to have social consequences other than perhaps to preserve the status quo. Yet, those who have had the most significant positive and long-lasting impact on human history have been those actors who have found a way to connect their inner and outer lives with integrity. A truly pious spirituality will then include resistance to technique-as-Power, and resistance to technique-as-Power will include personal spirituality.

Conclusion

We need to speak about technique in such a way that spirit is conceptualized as a person who can do things. This means that we need to examine the spirit-language of technology for hints as to the personhood and the freedom/efficacy of spirit. If the kind of spirit that is assumed *a priori* by the methods of technological discourse is not a person and cannot do things, then I suspect that "spirit" is simply being used as a placeholder for our own ignorance, as a sentimental gloss on our own presuppositions, or to protect our political agendas from scrutiny by sanctifying them. But if the Spirit of God *is* a person who can do things, then that spirit is going to be able to question us. Perhaps that spirit

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might even challenge our hubris – our self-congratulating theologies and our sense of

exceptionalism *vis-à-vis* the Other that we meet in nature, in our neighbour, and in God.

CONCLUSION

Technique – craft, skill, or method – is an aspect of reality that holds great significance for the religious life, but has received relatively little theological treatment historically. Because theology has failed to provide compelling myths to frame technique, popular culture has developed its own stories. These narratives are mirrored in academic literature, and have been summarized as technological optimism, pessimism, and instrumentalism. Yet this way of summarizing the available options misses some of the texture which historical cultures have conveyed through mythology or religious cosmology. Today, social critics with a religious perspective are beginning to make up for this lack by narrating a worldview which places appropriate limits on technique. In this, they would be well served by a deeper analysis of the meaning of technique in theological terms.

Though technique has become a more common theme in theology today, this shift has only happened quite recently. Even now, theological treatment of technique falls into two main modes: describing the problems in a technological society, or imagining a technological future. Tillich's work is paradigmatic of the first mode, and for most of the twentieth century theology generally followed his impulse to describe "the spiritual

situation in our technical society." The work of Teilhard de Chardin is paradigmatic of the second mode, which actively imagines a future made possible by technique. Toward the end of the twentieth century and into the twenty-first, this approach gained in popularity, and has now become the more typical mode of theological engagement with technology. A third option represented by Heidegger and Ellul – to analyze the meaning of technique – has not received as significant treatment by theology as it has by sociology and philosophy.

Given the lack of extensive theological investigation into the meaning of technique, it is difficult to know where to begin to address this third option. The methods of theological inquiry lend themselves more toward the study of language than of phenomena (as sociology might), so I approached theology as grammar, and chose to look at technology rather than technique itself. As an avenue into the *meaning* of technique, I surveyed the use of spirit-language in technology. In religion-and-science discourse, spirit is claimed as a link between the world of science and the world of theology. In ecological discourse, spirit inhabits nature and sacralizes it. In social criticism, spirit (especially the Powers) animates social institutions and the images of public personas. In ancient discourse on technique, spirit provides a *telos* for matter. In modern technology, Götz sees spirit as the source of Being for all beings, while Ellul sees the Spirit of God as the source of a particular kind of freedom and life.

The conception of spirit by religion-and-science discourse assumes materialism *a priori*, and so produces a spirit that is quasi-material and impersonal. Empiricism is the controlling discourse, and so an empirical world-view is absolutized. The result is not the

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well-known conflict (misguided though it may be) between religion and science, but a new conflict between religion(s) and science-as-religion, or Scientism. The pneumatology of Scientism differs from biblical pneumatology, perhaps most significantly in terms of contingency and grace. Reading biblical pneumatology back into religion-and-science produces a theological criticism of a technological conception of spirit as proposed by Scientism: spirit is not merely the magical ghost that makes the machine work (the "spirit of the gaps" or the *deus ex machina*). Spirit must also be a person whose freedom is not limited by the operations of the machine.

The conception of spirit by the religious pluralism of Götz and Teilhard de Chardin is also materialist, but different from the materialism of science. Empiricism is an important assumption, but the controlling discourse is religious pluralism: there is an over-arching desire to relativize and synthesize all religious truth. Therefore, spirit is an indistinct Being inhabiting all matter, and in particular is that thing that all beings have in common. This spirit lacks personality, because personality would imply distinction and therefore separation, and separation would be antithetical to the purpose of this spirit, which is to unify. This spirit is also uncritical, since there can be no criticism without first making distinctions. Biblical pneumatology differs from religious pluralism in that the biblical spirit makes distinctions: there are "evil spirits" and "human spirits" and "Holy Spirit." Reading biblical pneumatology back into religious pluralism produces the theological criticism that spirit must be conceived as multiple: not all spirit is the Spirit of God.

The conception of spirit by ecology is materialist in yet another way: spirit

inhabits living matter in particular. Spirit belongs to nature rather than to manufactured products; therefore it is possible to speak of killing or destroying spirit. Like the spirit of religious pluralism, this spirit is immanent rather than transcendent. Yet because it is not completely universal, it is possible for spirit to make distinctions, and therefore it is possible for us to imagine this spirit as personal. This spirit is the spirit of Life, and we can imagine a personal being distinguishing between life and death and actively working to produce life in the universe. This spirit is capable of making distinctions, but also of unifying. However, the ecological concept of spirit differs from biblical pneumatology, which depicts the Breath of God being deposited specifically with humanity. Reading biblical pneumatology back into ecology produces the theological criticism that the Breath of God must be distinguished from the spirit of nature.

The spirit of social criticism is not a materialist spirit, but a social or institutional spirit, more typically called a Power. A Power belongs to objective institutions, but is perceived subjectively. The way the language of Powers is used in social criticism usually implies personhood, but the personhood of Powers rarely informs the discourse. Spirit-language in social criticism (including spirit, Power, soul) refers to a type of existence called spirit, to which individual spirits belong. Because some of the most significant work on the Powers was done by biblical scholar Walter Wink, the concept of the Powers is much closer to biblical pneumatology than the other conceptions of spirit. However, the Powers differ from biblical pneumatology by placing an emphasis on the social systems at the expense of the individual. The biblical witness includes the Powers, but it places considerably more emphasis on individual spirits. Reading biblical pneumatology

back into social criticism produces the theological reminder to find a relationship between personal spirits and institutional Powers.

The comparison of technological pneumatologies with Christian pneumatologies has raised several methodological issues with spirit-language. The first issue is the question of which Christian pneumatology to use as the standard. In this project, I have resolved this difficulty by appealing to some of the more uncontroversial aspects of biblical pneumatology. In this, I hope to have demonstrated the viability of this method to produce meaningful positions rather than convince the reader of any particular positions. The second issue is the difficulty of speaking about spirit as person. Granted, not all technological pneumatologies (or even biblical pneumatologies) intend to conceptualize spirit as person. But for those that do, incorporation of personality theory from psychology or philosophy (or, in the case of biblical pneumatology, a study of personality in historical philosophy) may be required in order to give the personality of the spirit content. The third issue is the ambiguity of the concept of freedom. Again, freedom is not necessarily a significant concept for all technological pneumatologies, but it seems that freedom should at least be a part of any Christian theology. Here again, closer engagement with philosophical discussions of freedom may be enlightening. Finally, a purely grammatical difficulty: any engagement with technological pneumatologies needs to address the multiplicity of forms for writing "spirit," including "spirit," "Spirit," "the Spirit," and "Holy Spirit." Each of these forms carries a slightly different nuance, complicating a direct comparison of pneumatologies.

Several avenues lay open for future discussions of the spirit of technology. I have
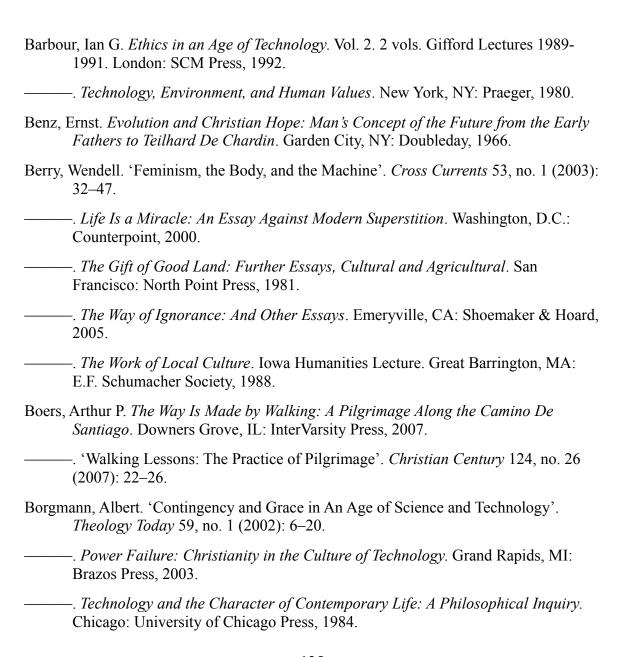
taken this project as far as reading biblical pneumatology back into technology's use of spirit-language. This has shown how a conversation between technology and theology can happen, and it has produced some critiques of technological pneumatology. However, these critiques are merely preliminary: what is needed is a systematic comparison of those pneumatologies. Systematic pneumatology would proceed according to the normal methods of theology. Where I was limited to a few arbitrarily chosen values (materiality, personhood, freedom, etc.), a systematic pneumatology would compare the spirits across a wider spectrum of attributes.

Another direction that this work could take is to consider how Christian beliefs about the Spirit of God could or should change technology. This project suggests at least two important avenues for such a discussion: the implications of the personal Spirit of God on technique-as-Power, and an evaluation of the kind of control enabled by technique in light of the Christian's submission to God. Does conceptualizing the Spirit of God and other spirits as persons affect how we speak about and interact with the spirit of technique in our daily lives? And what would it mean for the Power of technique to submit to the Holy Spirit?

Finally, a pneumatological discussion could begin to shape the broader discourse around technique. Biblical pneumatology encourages certain adjustments to our conception of the spirit(s) of technique. After making these adjustments, how would the new concept of spirit affect other areas of technology? At this point, we would move from a technological pneumatology to a pneumatological technology. Pneumatology would impose limits and suggest possibilities for how we understand technique in our

world. In this way, Christian pneumatology has the potential to influence the entire discourse around technique in the modern world.

BIBLIOGRAPHY

Barbour, Ian G. *Ethics in an Age of Technology*. Vol. 2. 2 vols. Gifford Lectures 1989-1991. London: SCM Press, 1992.

———. *Technology, Environment, and Human Values*. New York, NY: Praeger, 1980.

Benz, Ernst. *Evolution and Christian Hope: Man's Concept of the Future from the Early Fathers to Teilhard De Chardin*. Garden City, NY: Doubleday, 1966.

Berry, Wendell. 'Feminism, the Body, and the Machine'. *Cross Currents* 53, no. 1 (2003): 32–47.

———. *Life Is a Miracle: An Essay Against Modern Superstition*. Washington, D.C.: Counterpoint, 2000.

———. *The Gift of Good Land: Further Essays, Cultural and Agricultural*. San Francisco: North Point Press, 1981.

———. *The Way of Ignorance: And Other Essays*. Emeryville, CA: Shoemaker & Hoard, 2005.

———. *The Work of Local Culture*. Iowa Humanities Lecture. Great Barrington, MA: E.F. Schumacher Society, 1988.

Boers, Arthur P. *The Way Is Made by Walking: A Pilgrimage Along the Camino De Santiago*. Downers Grove, IL: InterVarsity Press, 2007.

———. 'Walking Lessons: The Practice of Pilgrimage'. *Christian Century* 124, no. 26 (2007): 22–26.

Borgmann, Albert. 'Contingency and Grace in An Age of Science and Technology'. *Theology Today* 59, no. 1 (2002): 6–20.

———. *Power Failure: Christianity in the Culture of Technology*. Grand Rapids, MI: Brazos Press, 2003.

———. *Technology and the Character of Contemporary Life: A Philosophical Inquiry*. Chicago: University of Chicago Press, 1984.

Breck, John. 'Bio-Medical Technology: Of the Kingdom or of the Cosmos?' *St. Vladimir's Theological Quarterly* 32, no. 1 (1988): 5–26.

Brende, Eric. *Better Off: Flipping the Switch on Technology*. New York, NY: HarperCollins, 2004.

Brenner, William H. 'Theology as Grammar'. *The Southern Journal of Philosophy* 34 (1996): 439–54.

Cahalan, Kathleen. 'Temperance and Technology'. *Chicago Studies* 41, no. 1 (2002): 26–35.

Cardwell, Donald S. L. 'Problems of the Data Base'. In *The History and Philosophy of Technology*, edited by George Bugliarello and Dean B. Doner, 3–18. Urbana, IL: University of Illinois Press, 1979.

Cavanaugh, William T. 'The World in a Wafer: A Geography of the Eucharist as Resistance to Globalization'. *Modern Theology* 15, no. 2 (1999): 181–96.

Chapman, Audrey R. 'Genetic Engineering and Theology: Exploring the Interconnections'. *Theology Today* 59, no. 1 (2002): 71–89.

Cole-Turner, Ronald, ed. *Beyond Cloning: Religion and the Remaking of Humanity*. Harrisburg, PA: Trinity Press International, 2001.

———., ed. *Design and Destiny: Jewish and Christian Perspectives on Human Germline Modification*. Basic Bioethics. Cambridge, MA: MIT Press, 2008.

———. *Genetics and Theology: The Anxiety of Change and the Humility of Hope*. Oxford: Harris Manchester College, 1996.

———., ed. *Human Cloning: Religious Responses*. Louisville, KY: Westminster John Knox Press, 1997.

———. *Pastoral Genetics: Theology and Care at the Beginning of Life*. Cleveland, OH: Pilgrim Press, 1996.

———. 'Science, Technology, and the Mission of Theology in a New Century'. In *God and Globalization: The Spirit and the Modern Authorities*, edited by Max L. Stackhouse, Peter J. Paris, and Don S. Browning, 2:139–65. Theology for the Twenty-First Century. Harrisburg, PA: Trinity Press International, 2001.

Crawford, Matthew. *Shop Class As Soulcraft: An Inquiry into the Value of Work*. New York: Penguin Press, 2009.

Davis, Gregory. *Means Without End: A Critical Survey of the Ideological Genealogy of Technology Without Limits, from Apollonian Techne to Postmodern Technoculture*. Lanham, MD: University Press of America, 2006.

Dawn, Marva. 'Introduction'. In *Sources & Trajectories: Eight Early Articles by Jacques Ellul That Set the Stage*, translated by Marva Dawn, 1–9. Grand Rapids, MI: Eerdmans, 1997.

———. *Unfettered Hope: A Call to Faithful Living in an Affluent Society*. Louisville, KY: Westminster John Knox Press, 2003.

Deane-Drummond, Celia. 'Fabricated Humans? Human Genetics, Ethics and the Christian Wisdom Tradition'. *Dialog: A Journal of Theology* 44, no. 4 (2005): 365–74.

Drees, Willem B. '"Playing God? Yes!": Religion in the Light of Technology'. *Zygon* 37, no. 3 (2002): 643–54.

———. 'Religion In an Age of Technology'. *Zygon* 37, no. 3 (2002): 597–604.

———. *Technology, Trust, and Religion: Roles of Religions in Controversies on Ecology and the Modification of Life*. Leiden: Leiden University Press, 2009.

Drengson, Alan R. 'The Sacred and the Limits of the Technological Fix'. *Zygon* 19, no. 3 (1984): 259–75.

Ellul, Jacques. 'Cain, the Theologian of 1969'. *Katallagete: Be Reconciled* 2, no. 1 Winter (1968): 4–7.

———. 'Technique and the Opening Chapters of Genesis'. In *Theology and Technology: Essays in Christian Analysis and Exegesis*, edited by Carl Mitcham and Jim Grote, 123–37. Lanham, MD: University Press of America, 1984.

———. *The Politics of God and the Politics of Man*. Grand Rapids, MI: Eerdmans, 1972.

———. *The Presence of the Kingdom*. New York, NY: Seabury Press, 1967.

———. *The Technological Bluff*. Grand Rapids, MI: Eerdmans, 1990.

———. *The Technological Society*. Translated by John Wilkinson. New York, NY: Alfred A. Knopf, 1976.

———. *To Will & To Do: An Ethical Research for Christians*. Philadelphia, PA: Pilgrim Press, 1969.

Engelhardt, H. Tristram. 'Persons and Humans: Refashioning Ourselves in a Better Image and Likeness'. *Zygon* 19, no. 3 (1984): 281–95.

Fenimore, James Alan, Jr. 'How a Congregation's Identity Is Affected by the Introduction of Technology-Based Ministries'. Ph.D. diss., Drew University, 2001.

Friesen, Duane K. *Artists, Citizens, Philosophers: Seeking the Peace of the City: An Anabaptist Theology of Culture*. Waterloo, ON: Herald Press, 2000.

Gabriel, Andrew K. 'Pneumatological Perspectives for a Theology of Nature: The Holy Spirit in Relation to Ecology and Technology'. *Journal of Pentecostal Theology* 15, no. 2 (1 April 2007): 195–212.

Gaillardetz, Richard R. *Transforming Our Days: Spirituality, Community and Liturgy in a Technological Culture*. New York, NY: Crossroad Publishing Company, 2000.

Garner, Stephen Robert. 'Hacking with the Divine: A Metaphor for Theology-Technology Engagement'. *Colloquium* 37, no. 2 (2005): 181–95.

———. 'Transhumanism and the Imago Dei: Narratives of Apprehension and Hope'. Ph.D. diss., University of Auckland, 2006.

Götz, Ignacio. *Technology and the Spirit*. Westport, CT: Praeger, 2001.

Gozzi, Raymond. 'Jacques Ellul on Technique, Media, and the Spirit'. *New Jersey Journal of Communication* 8, no. 1 (2000): 79–90.

Grabow, Paul. 'An Alternative to Instrumentalism: Technology as a Form of Transcendence'. *International Journal of Technology, Knowledge and Society* 4, no. 3 (2008): 197–202.

Grant, George. *Technology and Justice*. Toronto, ON: Anansi, 1986.

Gregersen, Niels Henrik. 'Autopoiesis: Less than Self-Constitution, More than Self-Organization'. *Zygon* 34, no. 1 (1999): 117–38.

———. 'The Idea of Creation and the Theory of Autopoietic Processes'. *Zygon* 33, no. 3 (1998): 333–67.

Greider, William. *The Soul of Capitalism: Opening Paths to a Moral Economy*. New York, NY: Simon & Schuster, 2004.

Hall, Douglas John. *Thinking the Faith: Christian Theology in a North American Context*. Minneapolis, MN: Augsburg Fortress, 1989.

Hauerwas, Stanley. *A Community of Character: Toward a Constructive Christian Social Ethic*. Notre Dame, IN: University of Notre Dame Press, 1981.

———. 'Anabaptist Eyes on Biotechnology'. In *Viewing New Creations with Anabaptist Eyes: Ethics of Biotechnology*, edited by Roman J. Miller, Beryl H. Brubaker, and James C. Peterson, 243–53. Telford, PA: Cascadia, 2005.

———. *Suffering Presence: Theological Reflections on Medicine, the Mentally Handicapped, and the Church*. Notre Dame, IN: University of Notre Dame Press, 1988.

Hefner, Philip J. *Religion-and-Science as Spiritual Quest for Meaning: Proceedings of the Sixth Annual Goshen Conference on Religion and Science*. Edited by Carl S. Helrich. Goshen Conference on Religion and Science 6. Kitchener, ON: Pandora Press, 2008.

———. 'Technology and Human Becoming'. *Zygon* 37, no. 3 (2002): 655–65.

———. 'The Evolution of the Created Co-Creator'. *Currents in Theology and Mission* 15, no. 6 (1988): 512–25.

———. *The Promise of Teilhard: The Meaning of the Twentieth Century in Christian Perspective*. Philadelphia: Lippincott, 1970.

Heidebrecht, Paul C. 'Re-Reading Yoder in Order to Conscientiously Engage Technology Through the Practices of the Church'. Ph.D. diss., Marquette University, 2008.

Heidegger, Martin. *The Question Concerning Technology, and Other Essays*. New York, NY: Harper & Row, 1977.

Henderson, Charles P. 'The Internet as a Metaphor for God?' *Cross Currents* 50, no. 1–2 (2000): 77–83.

Hendry, George Stuart. *Theology of Nature*. Philadelphia, PA: Westminster Press, 1980.

Herzfeld, Noreen. 'Terminator or Super Mario: Human/Computer Hybrids, Actual and Virtual'. *Dialog: A Journal of Theology* 44, no. 4 (2005): 347–53.

Hopkins, Patrick D. 'Protecting God from Science and Technology: How Religious Criticisms of Biotechnologies Backfire'. *Zygon* 37, no. 2 (2002): 317–43.

Jardine, Murray. *The Making and Unmaking of Technological Society: How Christianity Can Save Modernity from Itself*. Grand Rapids, MI: Brazos Press, 2004.

Kallenberg, Brad J. *God and Gadgets: Following Jesus in a Technological Age*. Eugene, OR: Cascade, 2011.

Kauffman, Stuart A. *Reinventing the Sacred: A New View of Science, Reason, and Religion*. New York, NY: Basic Books, 2008.

Kim, Kirsteen. *The Holy Spirit in the World: A Global Conversation*. Maryknoll, NY: Orbis Books, 2007.

Kline, Stephen J. 'What Is Technology?' *Bulletin of Science, Technology & Society* 5, no. 3 (1985): 215 –218.

Koss-Chioino, Joan D., and Philip J. Hefner, eds. *Spiritual Transformation and Healing: Anthropological, Theological, Neuroscientific, and Clinical Perspectives*. Lanham, MD: AltaMira Press, 2006.

Kraybill, Donald B. *The Riddle of Amish Culture*. Baltimore, MD: Johns Hopkins University Press, 1989.

Lazarsfeld, Paul F. 'Why Is So Little Known About the Effects of Television on Children and What Can Be Done?' *Public Opinion Quarterly* 19, no. 3 (1955): 243–51.

McKenny, Gerald P. 'Technologies of Desire: Theology, Ethics, and the Enhancement of Human Traits'. *Theology Today* 59, no. 1 (2002): 90–103.

———. *To Relieve the Human Condition: Bioethics, Technology, and the Body*. Albany, NY: University of New York Press, 1997.

Merton, Thomas. *The Way of Chuang Tzu*. New York, NY: New Directions, 1965.

Mitcham, Carl. 'Philosophy and the History of Technology'. In *The History and Philosophy of Technology,* edited by George Bugliarello and Dean B. Doner, 163–201. Urbana, IL: University of Illinois Press, 1979.

Moltmann, Jürgen. *God in Creation: An Ecological Doctrine of Creation*. Gifford Lectures 1984-1985. London: SCM Press, 1985.

———. *Science and Wisdom*. London: SCM Press, 2003.

Monsma, Stephen V. *Responsible Technology: A Christian Perspective*. Grand Rapids, MI: Eerdmans, 1986.

Noble, David F. *The Religion of Technology: The Divinity of Man and the Spirit of Invention*. New York, NY: Alfred A. Knopf, 1997.

Northcott, Michael. 'BP, the Blowout and the Bible Belt: Why Conservative Christianity Does Not Conserve Creation'. *The Expository Times* 122, no. 3 (2010): 117–26.

O'Donovan, Oliver. *Begotten or Made?: Human Procreation and Medical Technique*. New York, NY: Oxford University Press, 1984.

———. *Common Objects of Love: Moral Reflection and the Shaping of Community: The 2001 Stob Lectures*. Grand Rapids, MI: Eerdmans, 2002.

O'Donovan, Oliver, and Joan Lockwood O'Donovan. *Bonds of Imperfection: Christian Politics, Past and Present*. Grand Rapids, MI: Eerdmans, 2004.

Ovitt, George. 'The Cultural Context of Western Technology: Early Christian Attitudes toward Manual Labor'. *Technology and Culture* 27, no. 3 (1986): 477–500.

Palmer, Craig T., Lyle B. Steadman, Chris Cassidy, and Kathryn Coe. 'The Importance of Magic to Social Relationships'. *Zygon* 45, no. 2 (2010): 317–37.

Peacocke, Arthur. *Theology for a Scientific Age: Being and Becoming - Natural, Divine, and Human*. Minneapolis, MN: Fortress Press, 1993.

Peters, Ted. 'Hybrids & Human Integrity: Christian Anthropology and the Post-Human Future'. *Dialog: A Journal of Theology* 44, no. 4 (2005): 336–95.

Peterson, Gregory R. 'Imaging God: Cyborgs, Brain-Machine Interfaces, and a More Human Future'. *Dialog: A Journal of Theology* 44, no. 4 (2005): 337–46.

Peterson, James C. *Genetic Turning Points: The Ethics of Human Genetic Intervention*. Grand Rapids, MI: Eerdmans, 2001.

Pinker, Steven. *The Better Angels of Our Nature: Why Violence Has Declined*. New York: Viking, 2011.

Polkinghorne, John C. 'The Continuing Interaction of Science and Religion'. *Zygon* 40, no. 1 (2005): 43–49.

———. 'The Hidden Spirit and the Cosmos'. In *The Work of the Spirit: Pneumatology and Pentecostalism*, edited by Michael Welker, 169–82. Grand Rapids, MI: Eerdmans, 2006.

Polkinghorne, John C., and Michael Welker. *Faith in the Living God: A Dialogue*. Minneapolis, MN: Fortress Press, 2001.

Rousseau, Jean-Jacques. *The Major Political Writings of Jean-Jacques Rousseau: The Two Discourses and the Social Contract*. Translated by John T. Scott. Chicago, IL: The University of Chicago Press, 2012.

Russell, Robert John. 'Five Attitudes Toward Nature and Technology from a Christian Perspective'. *Theology and Science* 1, no. 2 (2003): 149.

Ryle, Gilbert. *The Concept of Mind*. New York, NY: Routledge, 2009.

Schatzberg, Eric. '"Technik" Comes to America: Changing Meanings of "Technology" before 1930'. *Technology and Culture* 47, no. 3 (July 2006): 486–512.

Schultze, Quentin. *Habits of the High-Tech Heart: Living Virtuously in the Information Age*. Grand Rapids, MI: Baker Academic, 2002.

———. *High-Tech Worship?: Using Presentational Technologies Wisely*. Grand Rapids, MI: Baker Books, 2004.

Soukup, Paul A., Francis J. Buckley, and David C. Robinson. 'The Influence of Information Technologies on Theology'. *Theological Studies* 62, no. 2 (2001): 366–77.

Stackhouse, John Gordon. *Making the Best of It: Following Christ in the Real World*. New York, NY: Oxford University Press, 2008.

Staudenmaier, John. *Technology's Storytellers: Reweaving the Human Fabric*. Cambridge, MA: MIT Press, 1985.

Stowers, Stanley. 'Matter and Spirit, or What Is Pauline Participation in Christ?' In *The Holy Spirit: Classic and Contemporary Readings*, edited by Eugene F. Rogers, 91–105. Malden, MA: Wiley-Blackwell, 2009.

Strassberg, Barbara. 'Magic, Religion, Science, Technology, and Ethics in the Postmodern World'. *Zygon* 40, no. 2 (2005): 307–22.

Stringfellow, William. *A Keeper of the Word: Selected Writings of William Stringfellow.* Edited by Bill Wylie-Kellerman. Grand Rapids, MI: Eerdmans, 1994.

———. *The Politics of Spirituality.* Philadelphia, PA: Wipf & Stock, 2006.

Studebaker, Steven M. 'The Spirit in Creation: A Unified Theology of Grace and Creation Care'. *Zygon* 43, no. 4 (December 2008): 943–60.

Tanner, Kathryn, ed. *Spirit in the Cities: Searching for Soul in the Urban Landscape.* Minneapolis, MN: Fortress Press, 2004.

Teilhard de Chardin, Pierre. 'The Evolution of Chastity'. In *Toward the Future*, 60–87. New York, NY: Harcourt Brace Jovanovich, 1975.

———. *The Future of Man*. New York, NY: Harper & Row, 1964.

———. *The Phenomenon of Man*. London: Collins, 1965.

Tillich, Paul. *The Spiritual Situation in Our Technical Society.* Edited by J. Mark Thomas. Macon, GA: Mercer University Press, 1988.

Tinker, George E. *Spirit and Resistance: Political Theology and American Indian Liberation*. Minneapolis, MN: Fortress Press, 2004.

Vardy, Peter. *Being Human: Fulfilling Genetic and Spiritual Potential*. London: Darton Longman & Todd, 2003.

Wagner, Rachel, and Frances Flannery-Dailey. 'Wake up! Worlds of Illusion in Gnosticism, Buddhism, and The Matrix Project'. In *Philosophers Explore The Matrix*, edited by Christopher Grau, 258–87. New York, NY: Oxford University Press, 2005.

Wallace, Mark I. *Fragments of the Spirit: Nature, Violence, and the Renewal of Creation*. New York, NY: Continuum, 1996.

Waters, Brent. 'What Is Christian about Christian Bioethics?' *Christian Bioethics* 11, no. 3 (2005): 281–95.

Welker, Michael. 'The Spirit in Philosophical, Theological, and Interdisciplinary Perspectives'. In *The Work of the Spirit: Pneumatology and Pentecostalism*, edited by Michael Welker, 221–32. Grand Rapids, MI: Eerdmans, 2006.

White, Lynn, Jr. *Medieval Religion and Technology: Collected Essays*. Berkeley, CA: University of California Press, 1978.

———. 'The Historical Roots of Our Ecologic Crisis'. *Science*, New Series, 155, no. 3767 (1967): 1203–7.

White, Susan J. *Christian Worship and Technological Change*. Nashville, TN: Abingdon Press, 1994.

Whitney, Elspeth. 'Paradise Restored. The Mechanical Arts from Antiquity through the Thirteenth Century'. *Transactions of the American Philosophical Society* 80, no. 1 (1990): 1–169.

———. 'The Mechanical Arts in the Context of Twelfth- and Thirteenth-Century Thought'. Ph.D. diss., City University of New York, 1985.

Wilkinson, Richard G., and Kate Pickett. *The Spirit Level: Why More Equal Societies Almost Always Do Better*. London: Allen Lane, 2009.

Wink, Walter. *Naming the Powers: The Language of Power in the New Testament*. Philadelphia, PA: Fortress Press, 1984.

———. *The Powers That Be: Theology for a New Millennium*. New York, NY: Doubleday, 1999.

———. *Unmasking the Powers: The Invisible Forces That Determine Human Existence*. Philadelphia, PA: Fortress Press, 1986.

———. *When the Powers Fall: Reconciliation in the Healing of Nations*. Minneapolis, MN: Fortress Press, 1998.

Wittgenstein, Ludwig. *Philosophical Investigations*. Oxford: Blackwell, 1958.

Yong, Amos. 'Ruach, the Primordial Chaos, and the Breath of Life: Emergence Theory and the Creation Narratives in Pneumatological Perspective'. In *The Work of the Spirit: Pneumatology and Pentecostalism*, edited by Michael Welker, 183–204. Grand Rapids, MI: Eerdmans, 2006.

———., ed. *The Spirit Renews the Face of the Earth: Pentecostal Forays in Science and Theology of Creation*. Eugene, OR: Pickwick Publications, 2009.

York, Donald G., and Anna York. 'The Spirit in Evidence: Stories of How Decisions Are Made'. In *The Work of the Spirit: Pneumatology and Pentecostalism*, edited by Michael Welker, 205–20. Grand Rapids, MI: Eerdmans, 2006.